Installation and Maintenance Manual	IM 1100

Air-Cooled Scroll Compressor Chiller

Group: **Chillers**
Part Number: IM 1100
Date: **October 18, 2010**

AGZ025DH - AGZ190DH

R-410A

50/60 Hz

© 2010 McQuay International

McQuay International
a member of DAIKIN group

Installation and Application Information 3
Handling 3
Unit Placement 4
Chilled Water Piping 9
Water Piping 10
Flow Switch 12
Glycol Solutions 13
Operating and Standby Limits 13
Dimensions 15
Lifting and Mounting Weights 22
Physical Data 28
Pressure Drop Data 34
Electrical Data 35
Electrical Data Notes 35
Field Wiring Diagram 36
Start-up and Shut-down Procedures 53
Pre Start-up 53
Start-Up 53
Shutdown 54
Component Operation 55
Component Operation 55
Wind Baffles and Hail Guards 57
. . . . . **58**
Revision History 60

Hazard Identification

⚠ DANGER

Dangers indicate a hazardous situation which will result in death or serious injury if not avoided.

⚠ WARNING

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

⚠ CAUTION

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

AHRI CERTIFIED™ www.ahridirectory.org Air-Cooled Chillers AHRI Standard 550/590 C

Modbus BACnet International ETL LISTED ETL LISTED LONMARK 3.4

**AHRI Certification and ETL Listing apply to 60Hz models only*

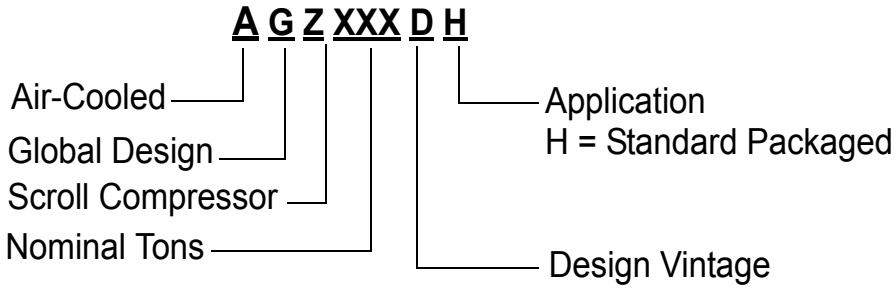
Note: Cover photograph is an AGZ190D with standard protective coil grilles.

This manual covers AGZ-D vintage air cooled scroll chillers. For AGZ-C vintage models, see IM 1078, available at www.mcquay.com.

Document:	IM 1100
Issue Date:	October 18, 2010
Revision Date:	--
Replaces:	NEW

©2010 McQuay International. Illustrations and data cover the McQuay International product at the time of publication and we reserve the right to make changes in design and construction at anytime without notice. ™® The following are trademarks or registered trademarks of their respective companies: LEED is a registered trademark of the U.S. Green Building Council; BACnet from ASHRAE; LONMARK, LonTalk, LONWORKS, and the LONMARK logo are managed, granted and used by LONMARK International under a license granted by Echelon Corporation; ElectroFin from AST ElectroFin Inc.; Modbus from Schneider Electric; FanTrol, MicroTech III, Open Choice from McQuay International

Chiller Nomenclature



⚠ WARNING

Installation is to be performed by qualified personnel who are familiar with local codes and regulations.

⚠ CAUTION

Sharp edges on unit and coil surfaces are a potential hazard to personal safety. Avoid contact with them.

General Description

McQuay Air-Cooled Water Chillers are complete, self-contained automatic chiller units designed for outdoor installation. Every unit is completely assembled, factory wired, charged, and tested.

The electrical control center includes all equipment protection and operating controls necessary for dependable automatic operation.

Additional Manuals

This manual covers the installation, of dual circuit, AGZ-DH packaged, scroll compressor chillers using R-410A.

Operating and maintenance information is contained in the operating manual OMM 1087, available at www.mcquay.com.

Inspection

Check all items carefully against the bill of lading. Inspect all units for damage upon arrival. Report shipping damage and file a claim with the carrier. Check the unit nameplate before unloading, making certain it agrees with the power supply available. McQuay is not responsible for physical damage after the unit leaves the factory.

Handling

Be careful to avoid rough handling of the unit. Do not push or pull the unit from anything other than the base. Block the pushing vehicle away from the unit to prevent damage to the sheet metal cabinet and end frame (see Figure 1).

To lift the unit, 2-1/2" (64mm) diameter lifting eyes are provided on the base of the unit. Arrange spreader bars and cables to prevent damage to the condenser coils or cabinet (see Figure 2).

Figure 1: Suggested Pushing Arrangment

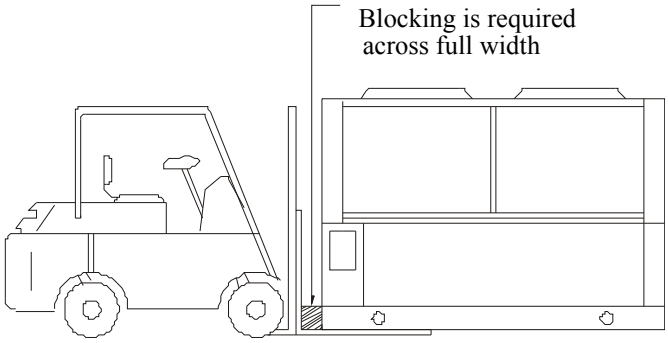
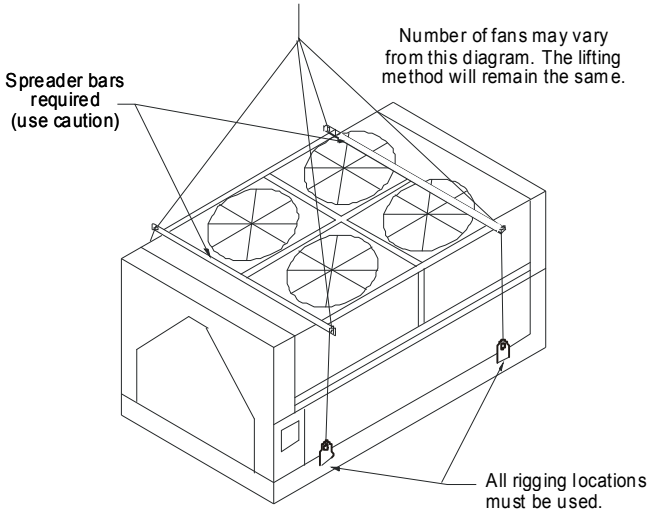


Figure 2: Required Lifting Arrangement



⚠ CAUTION

All lifting locations must be used to prevent damage to unit.

Installation and Application Information

Unit Placement

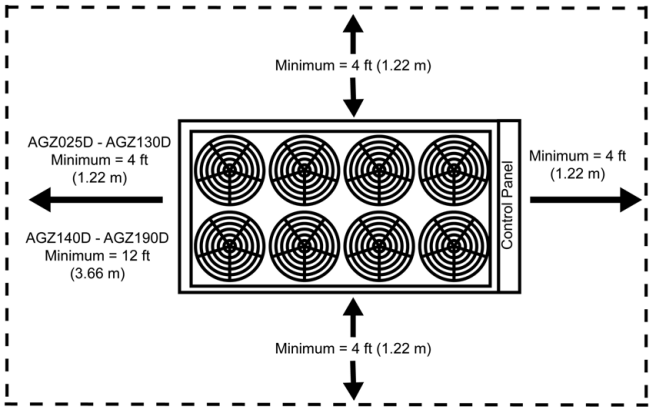
AGZ units are for outdoor applications and can be mounted either on a roof or at ground level. For roof mounted applications, install the unit on a steel channel or I-beam frame to support the unit above the roof. For ground level applications, install the unit on a substantial base that will not settle. Use a one-piece concrete slab with footings extended below the frost line. Be sure the foundation is level within the lesser of 0.25” per foot (6mm per 254mm) or 0.5"(13mm) over its length and width. The foundation must be strong enough to support the weights listed in the Physical Data Tables beginning on page 28.

Install the unit on vibration pads, springs or some other devise to keep the steel rais off the concrete pad if the unit is so mounted.

Service Clearance

Sides: Minimum of 4 feet (1.22 m)
Control panel end: Minimum of 4 feet
Opposite control panel:

- Minimum 4 feet on models 025 to 130;
- 12 feet on models 140-190 (allows clearance to remove the evaporator).



Air Clearance

Sufficient clearance must be maintained between the unit and adjacent walls or other units to allow the required unit air flow to reach the coils. Failure to do so will result in a capacity reduction and an increase in power consumption. No obstructions are allowed above the unit at any height.

Spacing Requirements

In general, with a small performance penalty in some cases, AGZ-D units can be spaced at four feet from other units or a wall. Curves on the following pages give the minimum clearance for different types of installations and also capacity reduction and power increase if closer spacing is used.

For convenience, the table below gives the minimum unit spacing with no performance penalty. Closer spacing will incur capacity penalties, however, these penalties are quite small and a unit may still meet the building load requirements.

Wind diretion and velocity can affect recirculation.

Table 1: Minimum Full Capacity Unit Spacing

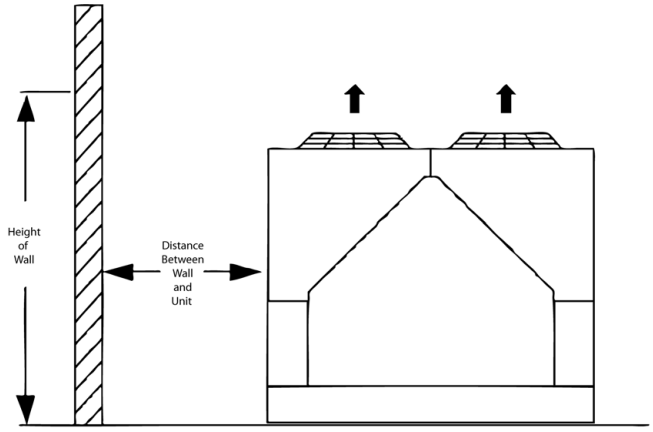
AGZ-D Unit Size		025-070	075-100	110-130	140-180	190
Case 1	Side Wall (Note 2)	4 (1.2)	4 (1.2)	6 (1.8)	6 (1.8)	7 (2.1)
Case 2	2 Units, Side-by-Side	4 (1.2)	4 (1.2)	6 (1.8)	6 (1.8)	14 (4.3)
Case 3	3 or More Units, Side-by-Side (Note 3)	4 (1.2)	4 (1.2)	8 (2.4)	10 (3.0)	12 (3.7)
Case 5	Pit, No Deeper than Unit Height (Note 4)	6 (1.8)	8 (2.4)	8 (2.4)	10 (3.0)	10 (3.0)

Note 1: Units of Measure: ft (m)
Note 2: For a wall higher than the unit, wall openings or greater distance is required for full capacity.
Note 3: Use Case 3 table value for inside unit. Use Case 2 value for either outside unit.

Case 1: Wall on One Side

In this case a solid wall up to 24-feet is considered. (For walls higher than 24 ft, use the 24-foot values.) Also use these charts for an adjacent building. For perforated screening walls, use Case 4. Spacing is differentiated by unit size families.

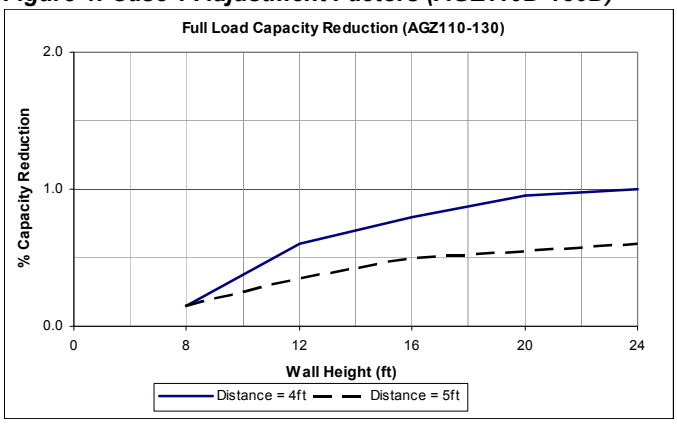
Figure 3: Wall on One Side of Unit



Note: Maintain a minimum of 4-feet on all sides; except models 140-190, which require 12-feet opposite the control panel to remove the evaporator.

For models AGZ 025-100: use 4 feet from any height wall. For models 110-190, use Performance Adjustment curves below.

Figure 4: Case 1 Adjustment Factors (AGZ110D-130D)



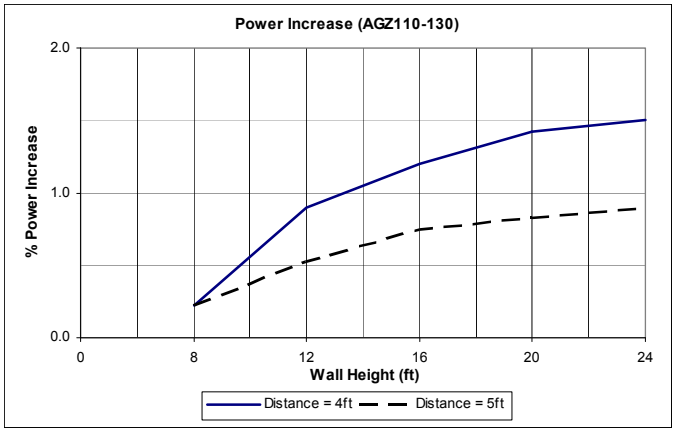
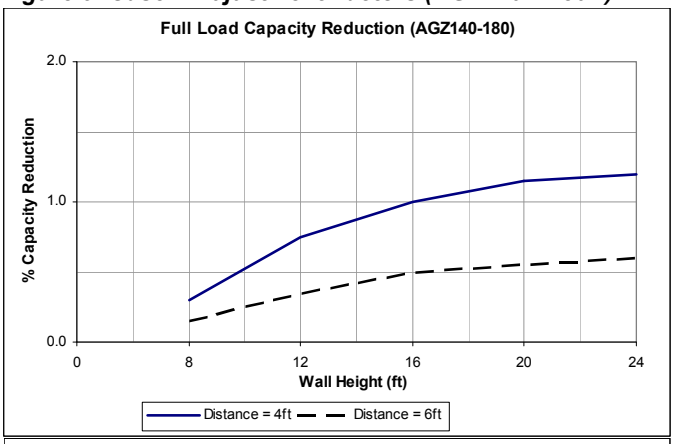


Figure 5: Case 1 Adjustment Factors (AGZ140D-180D)



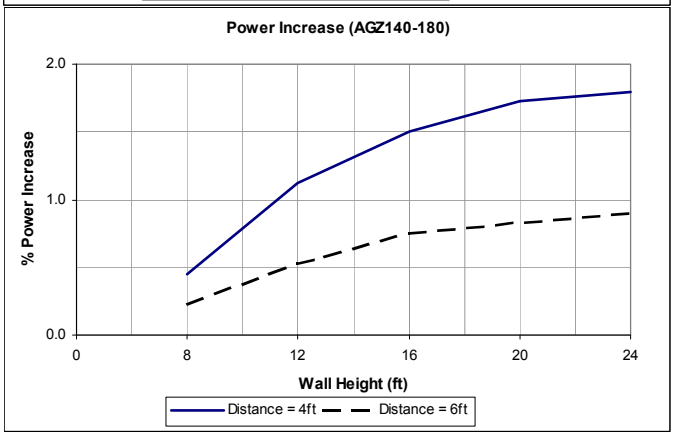
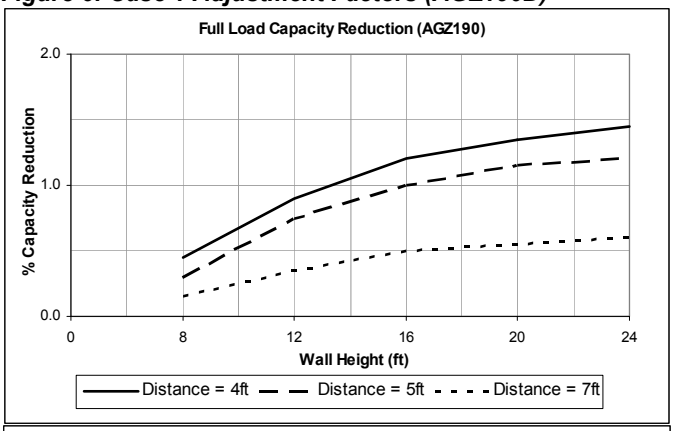
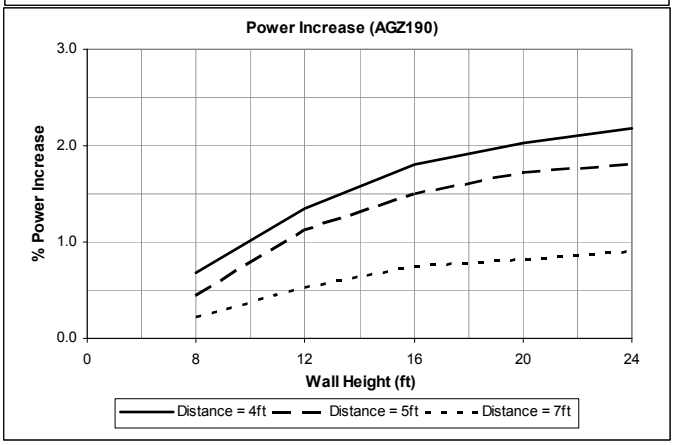


Figure 6: Case 1 Adjustment Factors (AGZ190D)

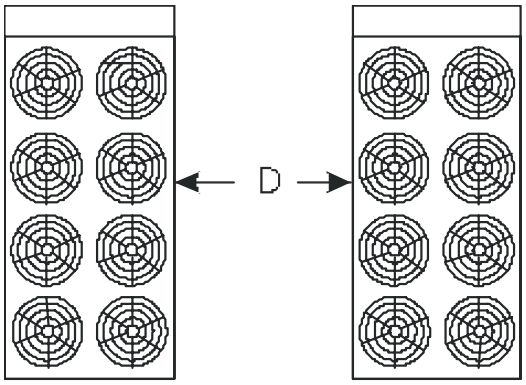




Case 2: Two Units, Side-by-Side

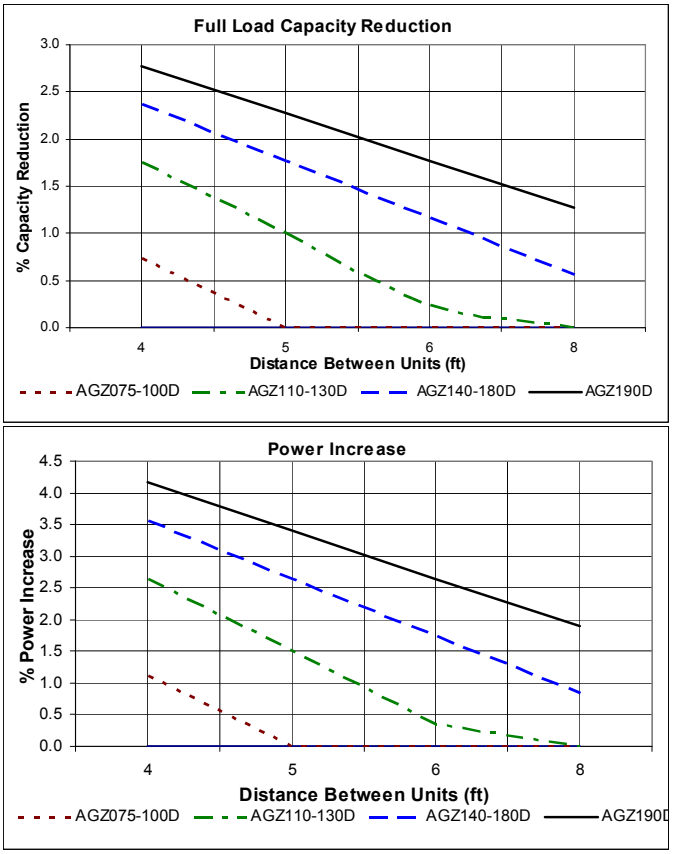
Maintain a minimum of 6-feet on all sides; except models 140-190, which require 12-feet opposite the control panel to remove the evaporator.

Figure 7: Case 2 - Two units side by side



For models AGZ 025-100: use 4 feet between units. For models 110-190, use Performance Adjustment chart in Figure 8.

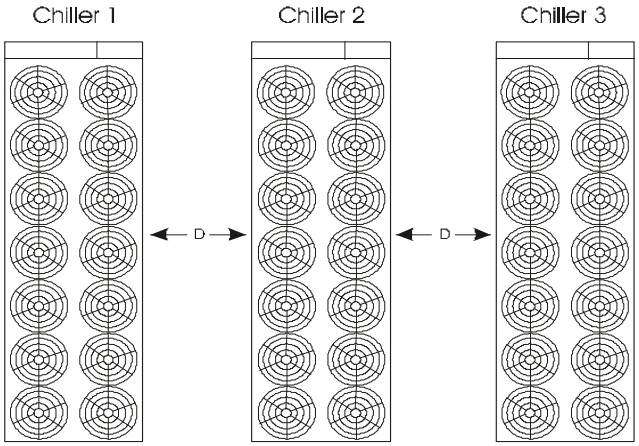
Figure 8: Case 2 Adjustment Factors



Case 3: Three or More Units, Side-by-Side

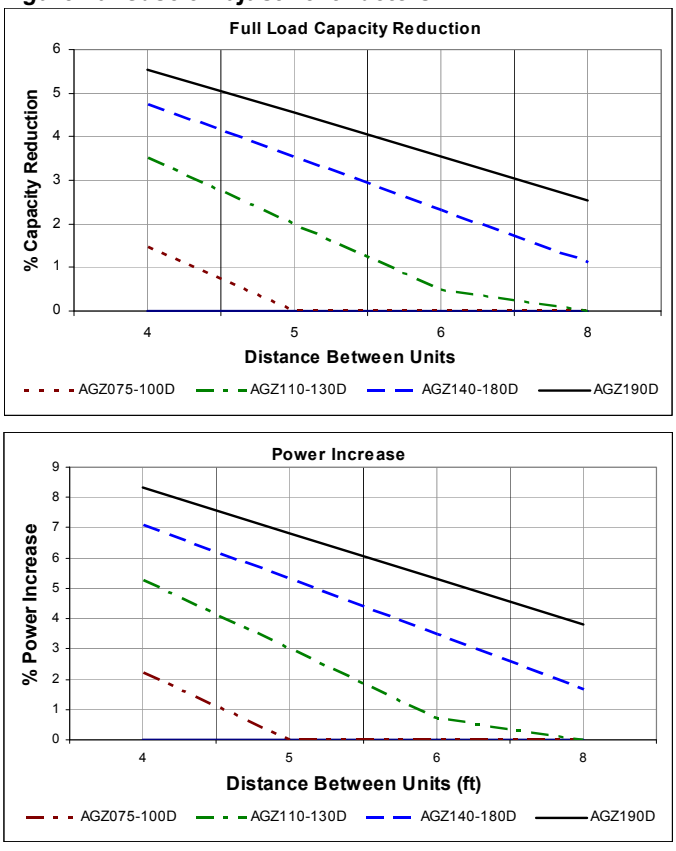
Maintain a minimum of 6-feet on all sides; except models 140-190, which require 12-feet opposite the control panel to remove the evaporator. For more than three units, allow an additional 2-feet clearance between units.

Figure 9: Case 3 - 3 units side by side



Data is for the middle unit - with a unit on each side. See Case 2, page 6 for Adjustment Factors for the two outside units.

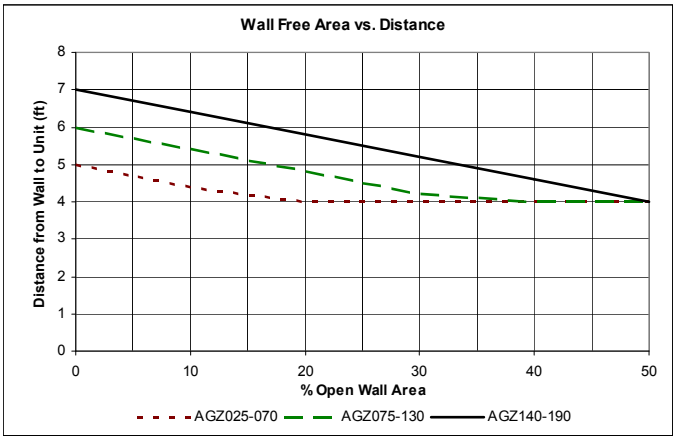
Figure 10: Case 3 Adjustment Factors



Case 4: Open Screening Walls

Decorative screening walls are often used to help conceal a unit either on grade or on a rooftop. Design these walls such that the combination of their open area and distance from the unit do not require performance adjustment. It is assumed that the wall height is equal to or less than the unit height when mounted on its base support. If the wall height is greater than the unit height, see Case 5, Pit Installation, page 7. The distance from the sides of the unit to the side walls must be sufficient for service, such as opening control panel doors. For uneven wall spacing, the distance from the unit to each wall can be averaged providing no distance is less than 4 feet. Values are based on walls on all four-sides.

Figure 11: Case 4 Adjustment Factor



Case 5: Pit Installation

Pit installations can cause operating problems resulting from recirculation and restriction, and require care that sufficient air clearance is provided, safety requirements are met and service access is provided. Pit covers must have abundant open area at least equal to the chiller footprint.A solid wall surrounding a unit is substantially a pit and this data should be used.

Steel grating is sometimes used to cover a pit to prevent accidental falls or trips into the pit. The grating material and installation design must be strong enough to prevent such accidents, yet provide abundant open area to avoid recirculation problems. Have any pit installation reviewed by McQuay prior to installation to ensure it has sufficient air-flow characteristics, and approved by the installation design engineer avoid risk of accident.

Figure 12: Case 5 - Pit Installation

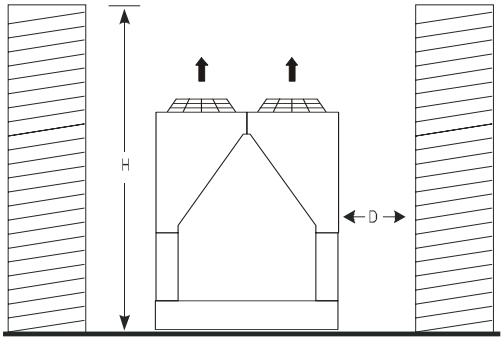
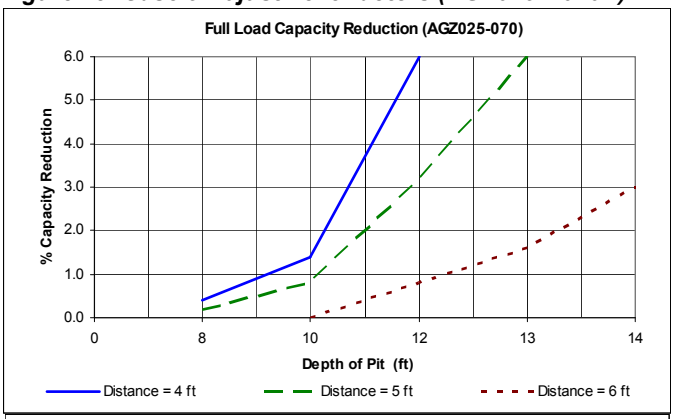


Figure 13: Case 5 Adjustment Factors (AGZ025D-070D)



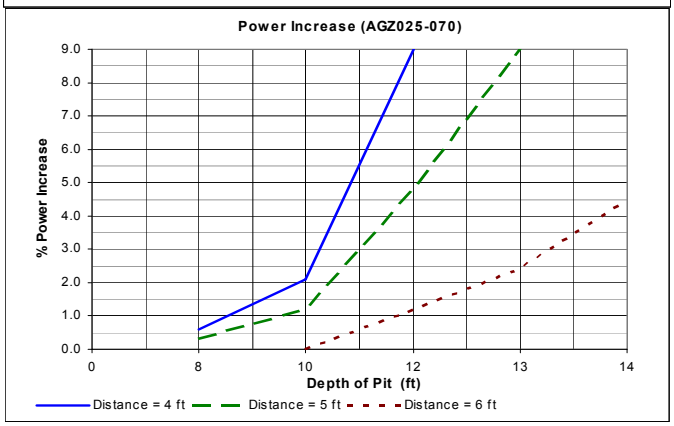
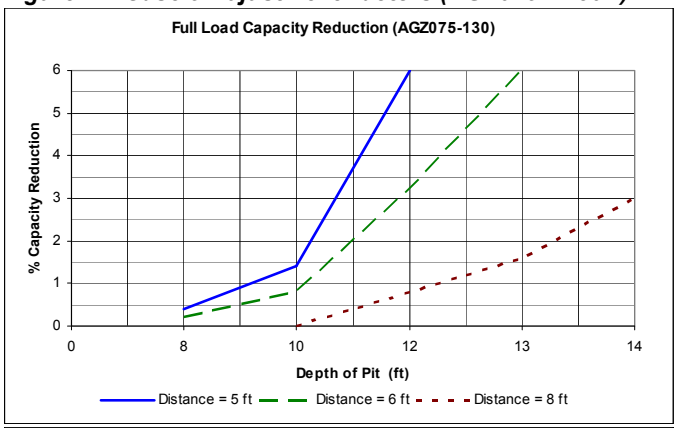


Figure 14: Case 5 Adjustment Factors (AGZ075D-130D)



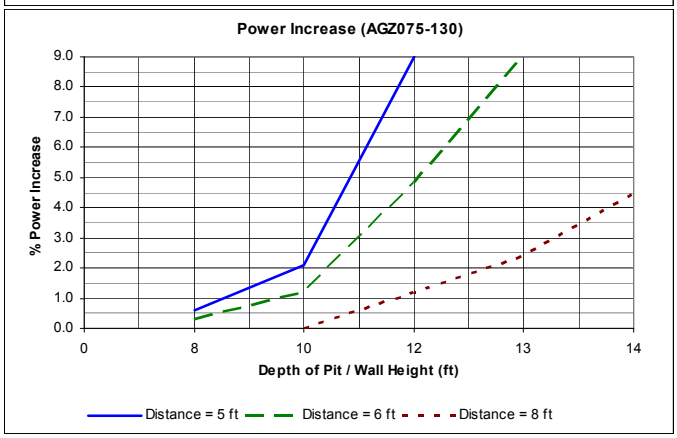
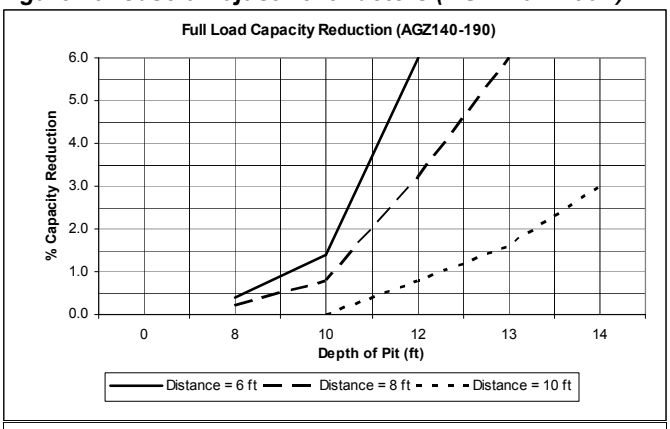


Figure 15: Case 5 Adjustment Factors (AGZ140D-190D)



Chilled Water Piping

Flush the system water piping thoroughly before making connections to the unit evaporator. Install a 40-mesh strainer in the inlet pipe to the chiller. Design the water piping so the chilled water circulating pump discharges into the evaporator inlet.

Connect the return water line to the evaporator inlet connection. Connect the supply water line to the evaporator outlet connection.

Install a flow switch in the horizontal piping of the supply (evaporator outlet) water line.

Provide drain connections at low points in the system to permit complete drainage of the system. Locate air vents at the high points in the system to purge air out of the system. A vent connection on top of the evaporator vessel allows air to be purged out of the evaporator. Purge air from the water system before unit start-up to provide adequate flow through the evaporator.

Install pressure gauges in the inlet and outlet water lines to the evaporator. Measure pressure drop through the evaporator and compare to flow as shown on page 34. Vibration eliminators are recommended in both the supply and return water lines.

Insulate chilled water piping to reduce heat loss and prevent condensation. Chillers not running in the winter should have their water systems thoroughly drained to protect against freezing. If the chiller operates year-round, or if the system is not drained for the winter, protect the chilled water piping exposed to outdoor temperature against freezing. Wrap the lines with a heater cable and add proper amount of glycol to the system to further protect the system.

The thermostat sensor is factory mounted in the leaving water well. If a field supplied and installed return water sensor is desired, install the sensor bulb in a field supplied well or strap to the outside of the water line.

Optional Inlet Strainer

An inlet water strainer kit is available to be field-installed, sized per Table 2 and with the pressure drop show in Figure 16. This pressure drop must be accounted for in the total system pressure drop. The kit consists of:

- (1) Y-type 40% open area strainer with 304 stainless steel perforated basket, Victaulic pipe connections and strainer cap
- (1) Extension pipe with (2) Schrader fittings that can be used for a pressure gauge and thermal dispersion flow switch. The pipe provides sufficient clearance from the evaporator for strainer basket removal.
- (1) ½-inch blowdown valve
- (2) Victaulic clamps

Figure 16: Strainer Pressure Drop

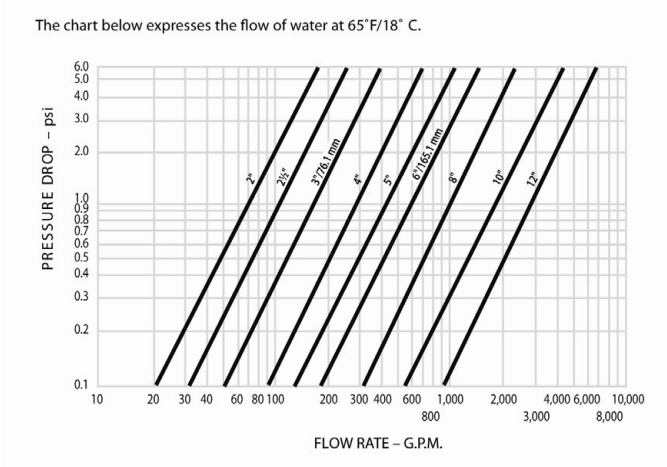


Table 2: Strainer Data

AGZ Model	Strainer Size (in.)	Strainer Plus Pipe Length (in.)	Strainer Weight (lbs)
025-055	2.5	16.75	14
060-130	3.0	17.75	20
140-190	8.0	36.00	125

Water Flow Limitations

Constant Flow

The evaporator flow rates and pressure drops shown on page page 34 are for full load design purposes. The maximum flow rate and pressure drop are based on a 6°F temperature drop. Avoid higher flow rates with resulting lower temperature drops to prevent potential control problems resulting from very small control bands and limited start up/shut off temperature changes.

The minimum flow and pressure drop is based on a full load evaporator temperature drop of 16°F. Evaporator flow rates below the minimum values can result in laminar flow causing freeze-up problems, scaling and poor control. Flow rates above the maximum values will result in unacceptable pressure drops and can cause excessive erosion, potentially leading to failure.

Evaporator Variable Flow

Reducing evaporator flow in proportion to load can reduce system power consumption. The rate of flow change should be a maximum of 10 percent of the flow per minute. For example, if the maximum design flow is 200 gpm and it will be reduced to a flow of 140 gpm, the change in flow is 60 gpm. Ten percent of 200 gpm equals 20 gpm change per minute, or a minimum of three minutes to go from maximum to minimum. Do not reduce flow lower than the minimum flows listed in the evaporator pressure drop section, page 45. The water flow through the vessel must remain between the minimum and maximum values listed on page 45. If flow drops below the minimum allowable, large reductions in heat transfer can occur. If the flow exceeds the maximum rate, excessive pressure drop and tube erosion can occur.

Figure 17: Typical Piping, Brazed-Plate Evaporator (models AGZ025D-130D)

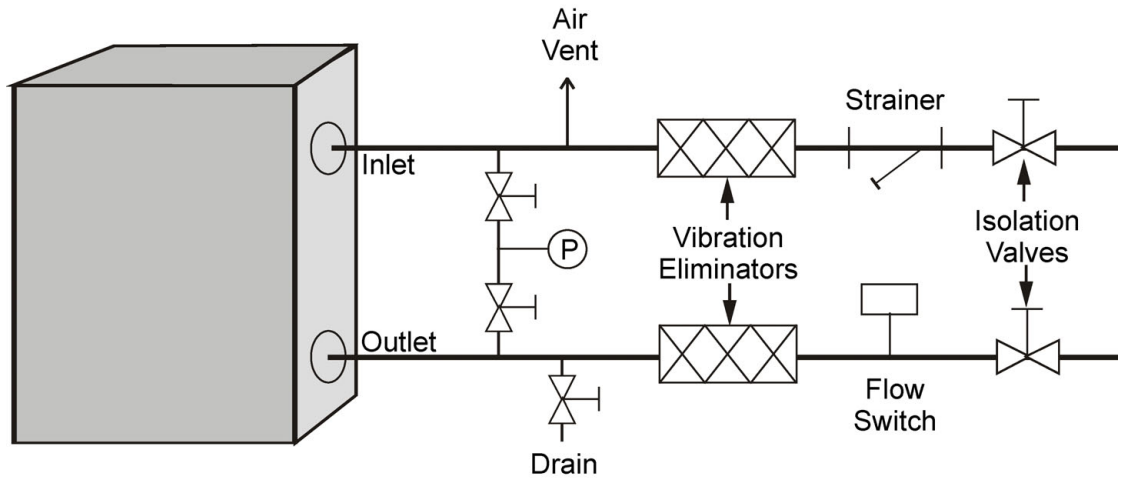
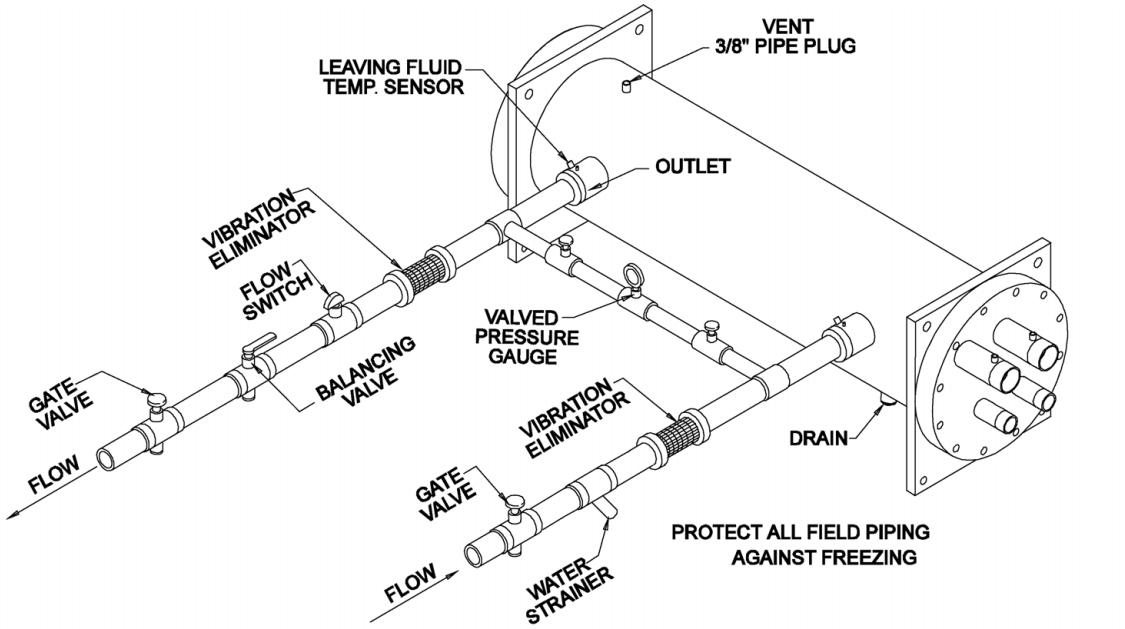


Figure 18: Typical Piping, Shell and Tube Evaporator (models AGZ140D-190D)



Water Piping

Piping for units with brazed-plate evaporators must have a drain and vent connection provided in the bottom of the lower connection pipe and to the top of the upper connection pipe respectively. These evaporators do not have drain or vent connections due to their construction.

Local authorities can supply the installer with the proper building and safety codes required for safe and proper installation.

Install piping with minimum bends and changes in elevation to minimize pressure drop. The following issues should be considered when designing and installing water piping:

1. Vibration eliminators to reduce vibration and noise transmission to the building.
2. Shutoff valves are required to isolate the unit from the piping during unit servicing.
3. Manual or automatic air vent valves at the high points of the system. Drains must be installed at the lowest points in the system.
4. Adequate water pressure must be maintained (expansion tank or regulating valve).
5. Temperature and pressure indicators located at the unit are required to aid in unit servicing.
6. A 40-mesh strainer or other means of removing foreign matter from the water before it enters the evaporator must be installed. The use of a strainer will prolong unit life and help maintain system performance.
7. Chilled water piping and strainer must be supported independently from the unit.

8 Models AGZ 025D through 130D require field-installed drains and vents adjacent to the unit. Their brazed-plate evaporators are not so equipped.

9 Flush the system water piping thoroughly before making connections to the unit evaporator. Design the water piping so the chilled water circulating pump discharges into the evaporator inlet.

10 The unit's evaporator has a thermostat and heater to prevent freeze-up down to -20 F (29 C). The heating cable can be wired to a separate 115 V supply circuit. As shipped from the factory, the heating cable is wired to the control circuit. All water piping to the unit must also be protected to prevent freezing.

11 If the unit is used as a replacement chiller, flush the system thoroughly before unit installation. Regular water analysis and chemical water treatment for the evaporator loop is recommended immediately at equipment start-up.

12 The total water volume in the system should be sufficient to prevent frequent "on-off" cycling. Turnover rate should not be less than 4 minutes for normal variable cooling loads.

13 When glycol is added to the water system for freeze protection, the refrigerant suction pressure will be lower, cooling performance less, and water side pressure drop greater. If the percentage of glycol is high, or if propylene is used instead of ethylene glycol, the added pressure drop and loss of performance could be substantial. When Glycol or Ice are selected as Unit Mode, the MicroTech II control will automatically reset the available range for the Leaving Water Temperature, Freezestat and Evaporator Pressure settings.

14 Reset the freezestat setting to 6 degrees F (3.3 degrees C) below the leaving chilled water setpoint temperature after the glycol percentage is verified safe for the application. See the section titled "Glycol Solutions" on page 14 for additional information concerning glycol.

15 Perform a preliminary leak check before insulating the piping and filling the system.

16 Piping insulation should include a vapor barrier to prevent condensation and possible damage to the building structure.

Water Connections

Bring water piping to the evaporator through the side between the vertical supports. Provide taps for the connection of pressure gauges and thermometers in the inlet and outlet lines. Check the inlet and outlet labels on the unit against the certified drawings supplied on the job and be sure the water piping is hooked up correctly. Contact the McQuay sales office if any discrepancies exist.

System Water Volume Considerations

All chilled water systems need adequate time to recognize a load change, respond to that load change and stabilize, without undesirable short cycling of the compressors or loss of control. In air conditioning systems, the potential for short cycling usually exists when the building load falls below the minimum chiller plant capacity or on close-coupled systems with very small water volumes. Some of the things the designer should consider when looking at water volume are the minimum cooling load, the minimum chiller plant capacity during the low load period and the desired cycle time for the compressors. Assuming that there are no sudden load changes and that the chiller plant has reasonable turndown, a rule of thumb of "gallons of water volume equal to two to three times the chilled water gpm flow rate" is often used. A storage tank may have to be added to the system.

BAS should enable chiller only when there is a cooling demand.

Evaporator Freeze Protection

Evaporator freeze-up can be a concern in the application of air-cooled water chillers. To protect against freeze-up, insulation and electric heaters are furnished with the unit. Models 140 through 190 have immersion heaters with a thermostat; models 025 through 130 have an external plate heater and thermostat. They protect the evaporator down to -20° F (-29° C) ambient air temperature. Although the evaporator is equipped with freeze protection, it does not protect water piping external to the unit or the evaporator itself if there is a power failure or heater cable burnout. Consider the following recommendations for additional protection.

1 If the unit will not be operated during the winter, drain evaporator and chilled water piping and flush with glycol. Drain and vent connections are provided on the evaporator to ease draining.

2 Add a glycol solution to the chilled water system to provide freeze protection. Freeze point should be approximately ten degrees (F) below minimum design ambient temperature.

3 The addition of thermostatically controlled heat and insulation to exposed piping.

The evaporator heater cable is factory wired to the 115 volt circuit in the control box. This power should be supplied from a separate source, but it can be supplied from the control circuit. Operation of the heaters is automatic through the ambient sensing thermostat that energizes the evaporator heaters for protection against freeze-up. Unless the evaporator is drained in the winter or contains an adequate concentration of anti-freeze, the disconnect switch to the evaporator heater must not be open.

Temperature and Water Flow Limitations

Evaporator flow rates below the minimum values can result in laminar flow causing freeze-up problems, scaling and poor control. Flow rates above the maximum values will result in unacceptable pressure drops and can cause excessive erosion, potentially leading to failure.

Low Ambient Operation

Compressor staging is adaptively determined by system load, ambient air temperature, and other inputs to the MicroTech III control. A low ambient option with fan VFD allows operation down to -10° F (-23° C). The minimum ambient temperature is based on still conditions where the wind is not greater than five mph. Greater wind velocities will result in reduced discharge pressure, increasing the minimum operating ambient temperature. Field installed hail/wind guards are available to allow the chiller to operate effectively down to the ambient temperature for which it was designed.

High Ambient Operation

AGZ-D units for high ambient operation (105ºF to 125 F, 40.1 C to 51.7 C) require the addition of the optional high ambient package that includes a small fan with a filter in the air intake to cool the control panel.

All units with the optional VFD low ambient fan control automatically include the high ambient option.

Flow Switch

All chillers require a chilled water flow switch to check that there is adequate water flow through the evaporator ant to shut the unit down if there isn't. McQuay has two options for meeting this requirement.

1. A factory-mounted thermal dispersion flow switch.
2. A "paddle" type flow switch is available from McQuay (part number 017503300) for field mounting and wiring. Certain flow rates are required to open the switch and are listed in Figure 3. Wire from switch terminals Y and R to the unit control panel terminals shown on the field wiring diagrams, page 36 and page 37. Mount the flow switch in the leaving water line to shut down the unit when water flow is interrupted. A flow switch is an equipment protection control and should never be used to cycle a unit.

Installation should be per manufacturer's instructions included with the switch . There is also a set of normally closed contacts on the switch that can be used for an indicator light or an alarm to indicate when a "no flow" condition exists. Freeze protect any flow switch that is installed outdoors. .

NOTE: Differential pressure switches are not recommended for outdoor installation. They can freeze and not indicate a no-flow condition

Table 3: Flow Switch Minimum/Maximum Flow Rates

Pipe Size (NOTE !)		inch	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8
		mm	32 (2)	38 (2)	51	63 (3)	76	102 (4)	127 (4)	153 (4)	204 (5)
Min. Adjst.	Flow	gpm	5.8	7.5	13.7	18.0	27.5	65.0	125.0	190.0	205.0
		Lpm	1.3	1.7	3.1	4.1	6.2	14.8	28.4	43.2	46.6
	No Flow	gpm	3.7	5.0	9.5	12.5	19.0	50.0	101.0	158.0	170.0
		Lpm	0.8	1.1	2.2	2.8	4.3	11.4	22.9	35.9	38.6
Max. Adjst.	Flow	gpm	13.3	19.2	29.0	34.5	53.0	128.0	245.0	375.0	415.0
		Lpm	3.0	4.4	6.6	7.8	12.0	29.1	55.6	85.2	94.3
	No Flow	gpm	12.5	18.0	27.0	32.0	50.0	122.0	235.0	360.0	400.0
		Lpm	2.8	4.1	6.1	7.3	11.4	27.7	53.4	81.8	90.8

1 A segmented 3-inch paddle (1, 2, and 3 inches) is furnished mounted, plus a 6-inch paddle loose.

2 Flow rates for a 2-inch paddle trimmed to fit the pipe.

3 Flow rates for a 3-inch paddle trimmed to fit the pipe.

4 Flow rates for a 3-inch paddle.

5 Flow rates for a 6-inch paddle

Drain Valves at Start-up

Model sizes AGZ 140 and larger have shell-and-tube evaporators. They are drained of water in the factory and shipped with evaporator drain plugs removed and stored in the control panel or with an open ball valve in the drain holes. The drain is located on the bottom of the vessel. Be sure to replace plugs or close the valves prior to filling the vessel with fluid.

Glycol Solutions

The use of a glycol/water mixture in the evaporator to prevent freezing will reduce system capacity and efficiency, as well as increase pressure drop. The system capacity, required glycol solution flow rate, and pressure drop with glycol may be calculated using the following formulas and tables.

1 **Capacity** - Multiply the capacity based on water by the Capacity correction factor from Table 4 or Table 5.

2 **Flow** - Multiply the water evaporator flow by the Flow correction factor from Table 4 or Table 5 to determine the increased evaporator flow due to glycol. If the flow is unknown, it can be calculated from the following equation:

For Metric Applications - Use the following equation for metric applications:

3 **Pressure drop** - Multiply the water pressure drop from Table 20, page 34 by Pressure Drop correction factor from Table 4 or Table 5. High concentrations of propylene glycol at low temperatures may cause unacceptably high pressure drops.

4 **Power** - Multiply the water system power by Power correction factor from Table 4 or Table 5.

Test coolant with a clean, accurate glycol solution hydrometer (similar to that found in service stations) or refractto determine the freezing point. Obtain percent glycol from the freezing point table below. It is recommended that a minimum of 25% solution by weight be used for protection against corrosion or that additional compatible inhibitors be added. Concentrations above 35% do not provide any additional burst protection and should be carefully considered before using.

⚠ CAUTION

Do not use an automotive-grade antifreeze. Industrial grade glycols must be used. Automotive antifreeze contains inhibitors which will cause plating on the copper tubes within the chiller evaporator. The type and handling of glycol used must be consistent with local codes. .

Table 4: Ethylene Glycol Factors

% E.G.	Freeze Point		Capacity	Power	Flow	PD
	°F	°C				
10	26	-3.3	0.998	0.998	1.036	1.097
20	18	-7.8	0.993	0.997	1.060	1.226
30	7	-13.9	0.987	0.995	1.092	1.369
40	-7	-21.7	0.980	0.992	1.132	1.557
50	-28	-33.3	0.973	0.991	1.182	1.791

Table 5: Propylene Glycol Factors

% P.G.	Freeze Point		Capacity	Power	Flow	PD
	°F	°C				
10	26	-3.3	0.995	0.997	1.016	1.100
20	19	-7.2	0.987	0.995	1.032	1.211
30	9	-12.8	0.978	0.992	1.057	1.380
40	-5	-20.6	0.964	0.987	1.092	1.703
50	-27	-32.8	0.952	0.983	1.140	2.251

Operating and Standby Limits

Table 6: Operating Limits

Maximum standby ambient temperature	130°F (55°C)
Maximum operating ambient temperature	105°F (40°C)
-with optional high ambient package (see information under High Ambient Operation, page 12	125°F (52°C)
Minimum operating ambient temperature (standard control)	35°F (2°C)
Minimum operating ambient temperature (with optional low-ambient control)	-10°F (-23°C)
Leaving chilled water temperature	40°F to 60°F (2°C to 16°C)
Leaving chilled fluid temperatures (with anti-freeze) - Unloading is not permitted with fluid leaving temperatures below 25°F (-4°C). When ambient air temperature is above 100º F, minimum leaving chilled fluid temperature (with antifreeze) is 25°F (4°C)	15°F to 60°F (-9°C to 16°C)
Operating chilled water delta-T range	6 to 16°F (-14 to -9°C)
Maximum evaporator operating inlet fluid temperature	76°F (24°C)
Maximum evaporator non-operating inlet fluid temperature	100°F (38°C)

Vibration and Sound Isolation

Vibration isolators are recommended for all roof-mounted installations or wherever vibration transmission is a

consideration. The tables beginning page 23 list isolator loads for all unit sizes. Isolators are also recommended for slab installations, primarily to keep the unit base from resting its entire length directly on the slab.

Spring Isolator Installation

The unit should be initially installed on shims or blocks at the listed free height. When all piping, wiring, flushing, charging, etc. is completed, adjust the springs upward to load them and to provide clearance to remove the shims or blocks.

Installation of spring isolators requires flexible piping connections and at least three feet of conduit flex tie-ins. Piping and conduit must be supported independently of the unit.

Sound Isolation

The low sound level of the AGZ chiller is suitable for most applications. When additional sound reduction is necessary, locate the unit away from sound sensitive areas. Avoid locations beneath windows or between structures where normal operating sounds may be objectionable.

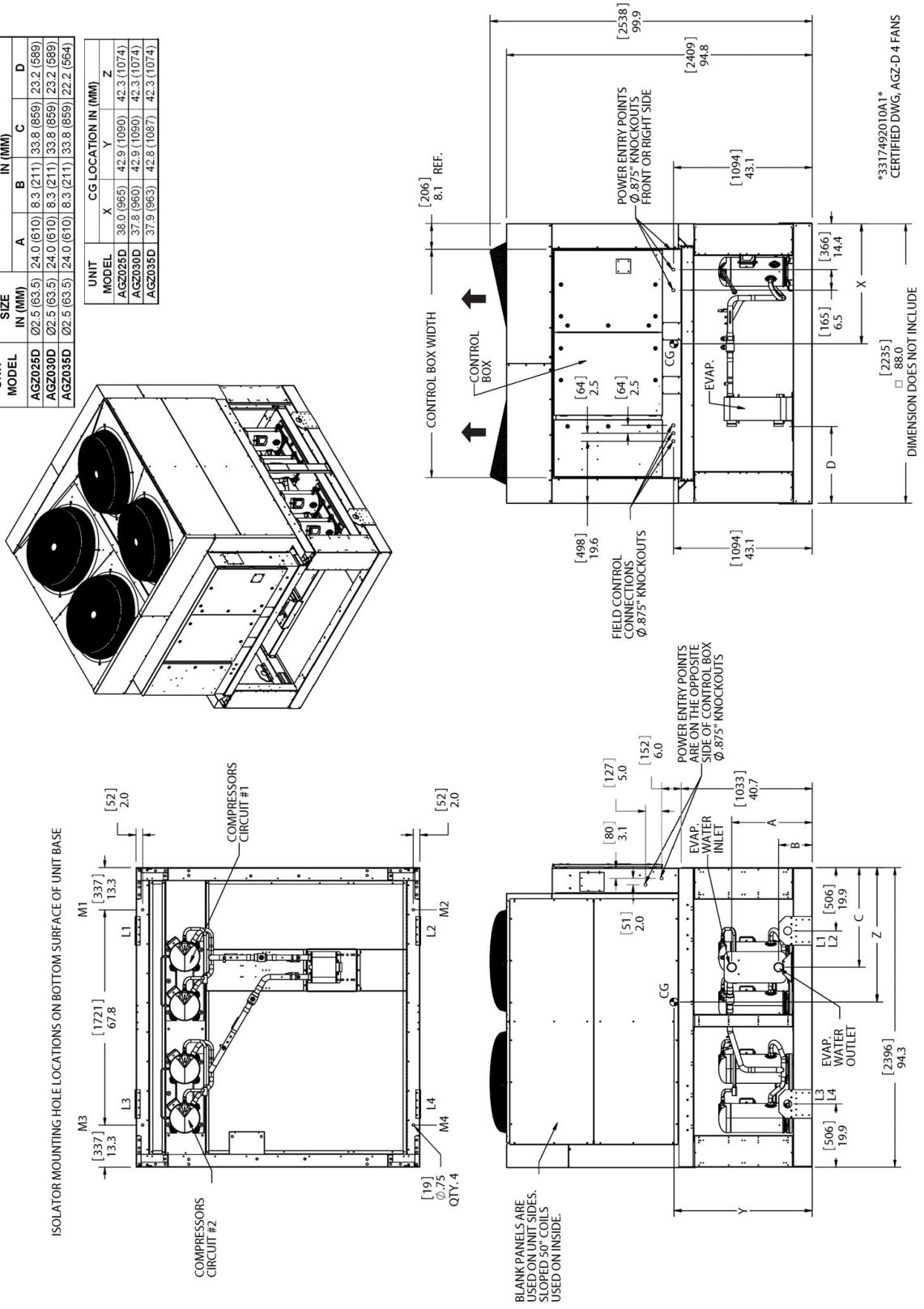
Reduce structurally transmitted sound by isolating water lines, electrical conduit and the unit itself. Use wall sleeves and rubber isolated piping hangers to reduce transmission of water or pump noise into occupied spaces. Spring isolators are effective in reducing the low amplitude sound generated by scroll compressors and for unit isolation in sound sensitive areas.

Compressor sound blankets are available as a factory or field installed option. They will reduce sound levels by two or three dB depending on unit size.

Figure 19: AGZ025DH - 035DH (Packaged)

UNIT MODEL	CONN. SIZE IN (MM)	EVAP DIMENSIONS IN (MM)			
		A	B	C	D
AGZ025D	Ø2.5 (63.5)	24.0 (610)	8.3 (211)	33.8 (859)	23.2 (589)
AGZ030D	Ø2.5 (63.5)	24.0 (610)	8.3 (211)	33.8 (859)	23.2 (589)
AGZ035D	Ø2.5 (63.5)	24.0 (610)	8.3 (211)	33.8 (859)	22.2 (564)

UNIT MODEL	CG LOCATION IN (MM)		
	X	Y	Z
AGZ025D	38.0 (965)	42.9 (1090)	42.3 (1074)
AGZ030D	37.8 (960)	42.9 (1090)	42.3 (1074)
AGZ035D	37.9 (963)	42.8 (1087)	42.3 (1074)



Dimensions

Figure 20: AGZ040DH - 070DH (Packaged)

UNIT MODEL	CONN. SIZE IN (MM)	EVAP DIMENSIONS IN (MM)			
		A	B	C	D
AGZ040D	Ø2.5 (63.5)	24.0 (610)	8.3 (211)	33.8 (859)	20.8 (528)
AGZ045D	Ø2.5 (63.5)	24.0 (610)	8.3 (211)	33.8 (859)	19.0 (483)
AGZ050D	Ø2.5 (63.5)	24.0 (610)	8.3 (211)	33.8 (859)	17.3 (439)
AGZ055D	Ø2.5 (63.5)	24.0 (610)	8.3 (211)	33.8 (859)	15.6 (396)
AGZ060D	Ø3.0 (76.2)	33.5 (851)	8.8 (224)	32.9 (836)	19.3 (490)
AGZ065D	Ø3.0 (76.2)	33.5 (851)	8.8 (224)	32.9 (836)	18.0 (457)
AGZ070D	Ø3.0 (76.2)	33.5 (851)	8.8 (224)	32.9 (836)	18.0 (457)

UNIT MODEL	CG LOCATION IN (MM)		
	X	Y	Z
AGZ040D	38.1 (968)	43.3 (1100)	42.5 (1080)
AGZ045D	38.6 (980)	44.3 (1125)	42.7 (1085)
AGZ050D	38.7 (983)	44.0 (1118)	42.6 (1082)
AGZ055D	38.8 (986)	44.9 (1140)	42.6 (1082)
AGZ060D	39.8 (1011)	45.8 (1163)	42.4 (1077)
AGZ065D	39.9 (1013)	45.6 (1158)	42.4 (1077)
AGZ070D	37.5 (953)	39.3 (998)	44.2 (1123)

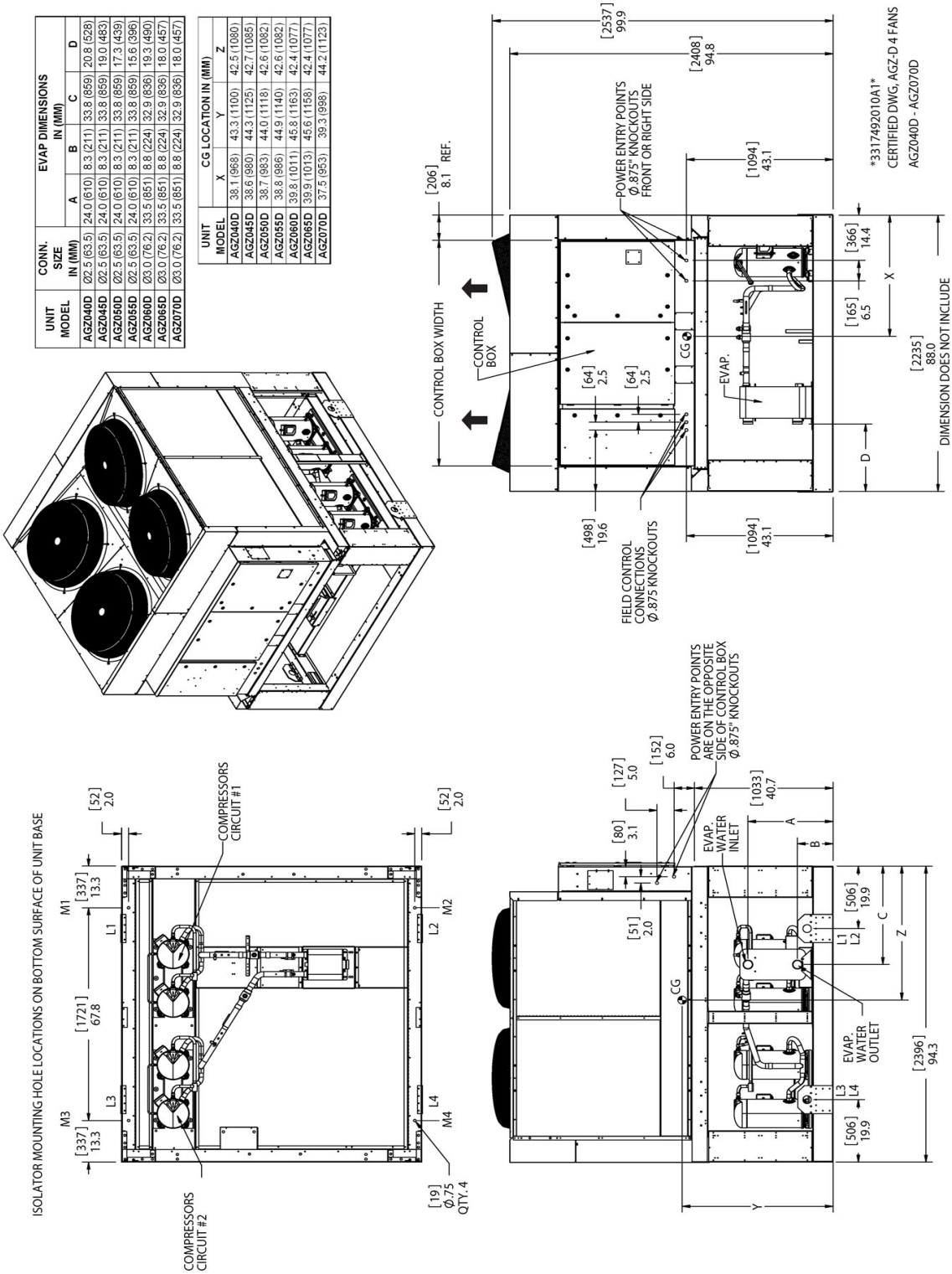
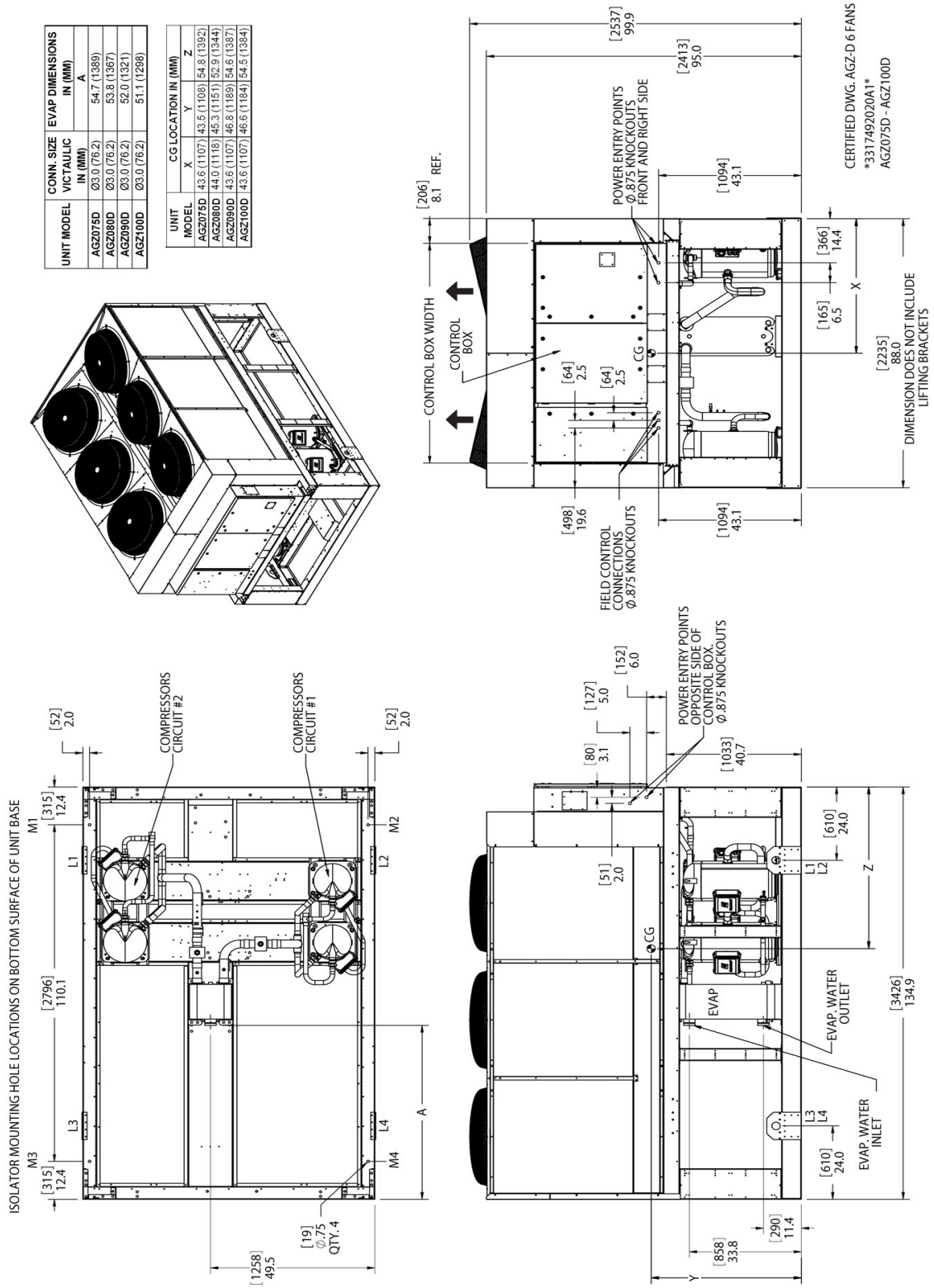


Figure 21: AGZ075DH - 100DH (Packaged)

UNIT MODEL	CONN. SIZE VICTAULIC IN (MM)	EVAP DIMENSIONS IN (MM) A
AGZ075D	Ø3.0 (76.2)	54.7 (1389)
AGZ080D	Ø3.0 (76.2)	53.8 (1367)
AGZ090D	Ø3.0 (76.2)	52.0 (1321)
AGZ100D	Ø3.0 (76.2)	51.1 (1298)

UNIT MODEL	CG LOCATION IN (MM) X	Y	Z
AGZ075D	43.6 (1107)	43.5 (1108)	54.8 (1392)
AGZ080D	44.0 (1118)	45.3 (1151)	52.9 (1344)
AGZ090D	43.6 (1107)	46.8 (1189)	54.6 (1387)
AGZ100D	43.6 (1107)	46.6 (1184)	54.5 (1384)



Dimensions

Figure 22: AGZ110DH - 130DH 208/230 volt models (460/575 next page)

UNIT MODEL	CONN. SIZE VICTAULIC IN (MM)	EVAP DIMENSIONS IN (MM) A
AGZ110D	Ø3.0 (76.2)	75.5 (1918)
AGZ125D	Ø3.0 (76.2)	73.3 (1862)
AGZ130D	Ø3.0 (76.2)	70.2 (1783)

UNIT MODEL	CG LOCATION IN (MM) X	Y	Z
AGZ110D	44.0 (1118)	42.9 (1090)	69.0 (1753)
AGZ125D	43.4 (1102)	44.1 (1120)	68.9 (1750)
AGZ130D	44.0 (1118)	45.3 (1151)	68.9 (1750)

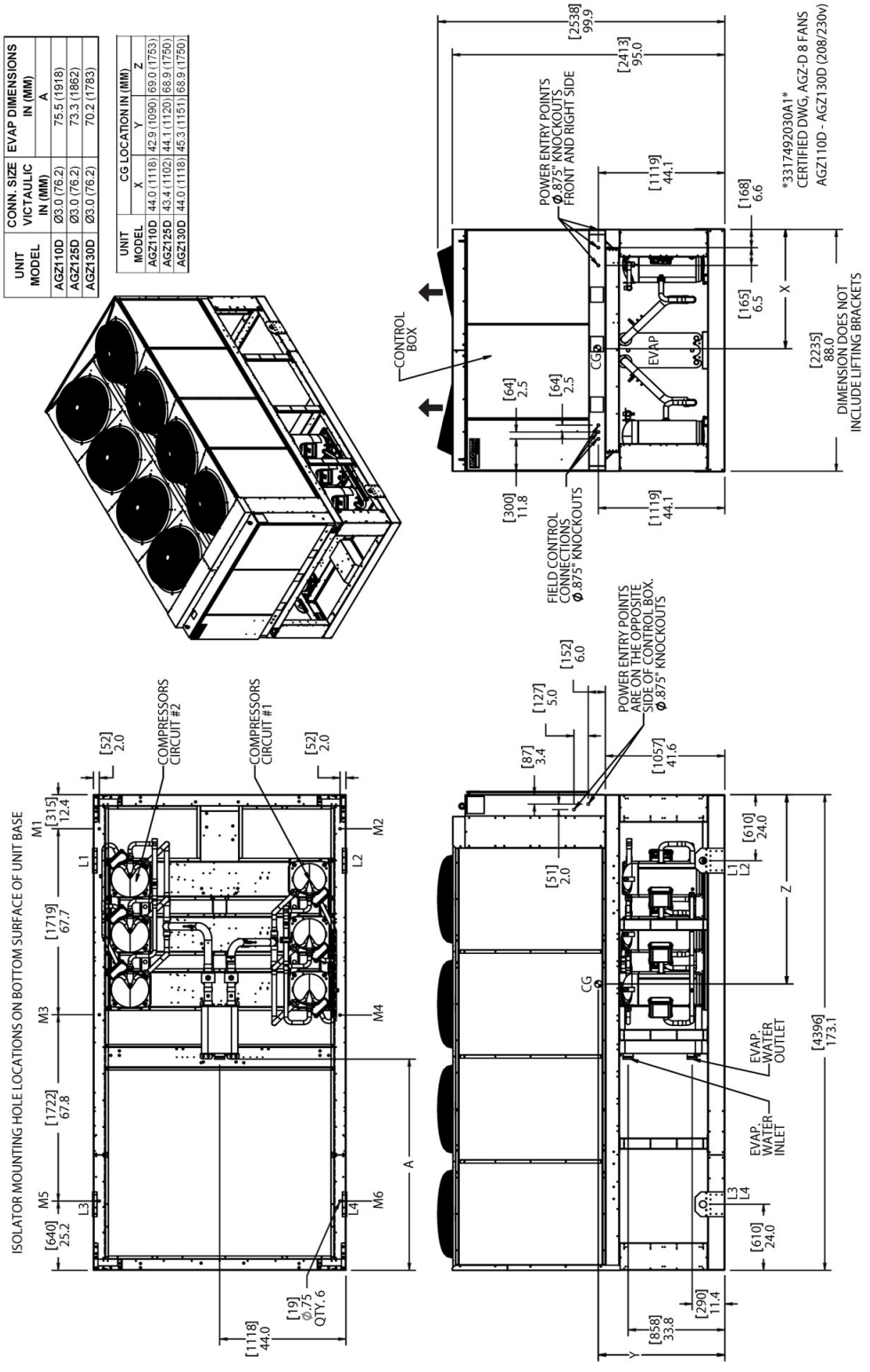
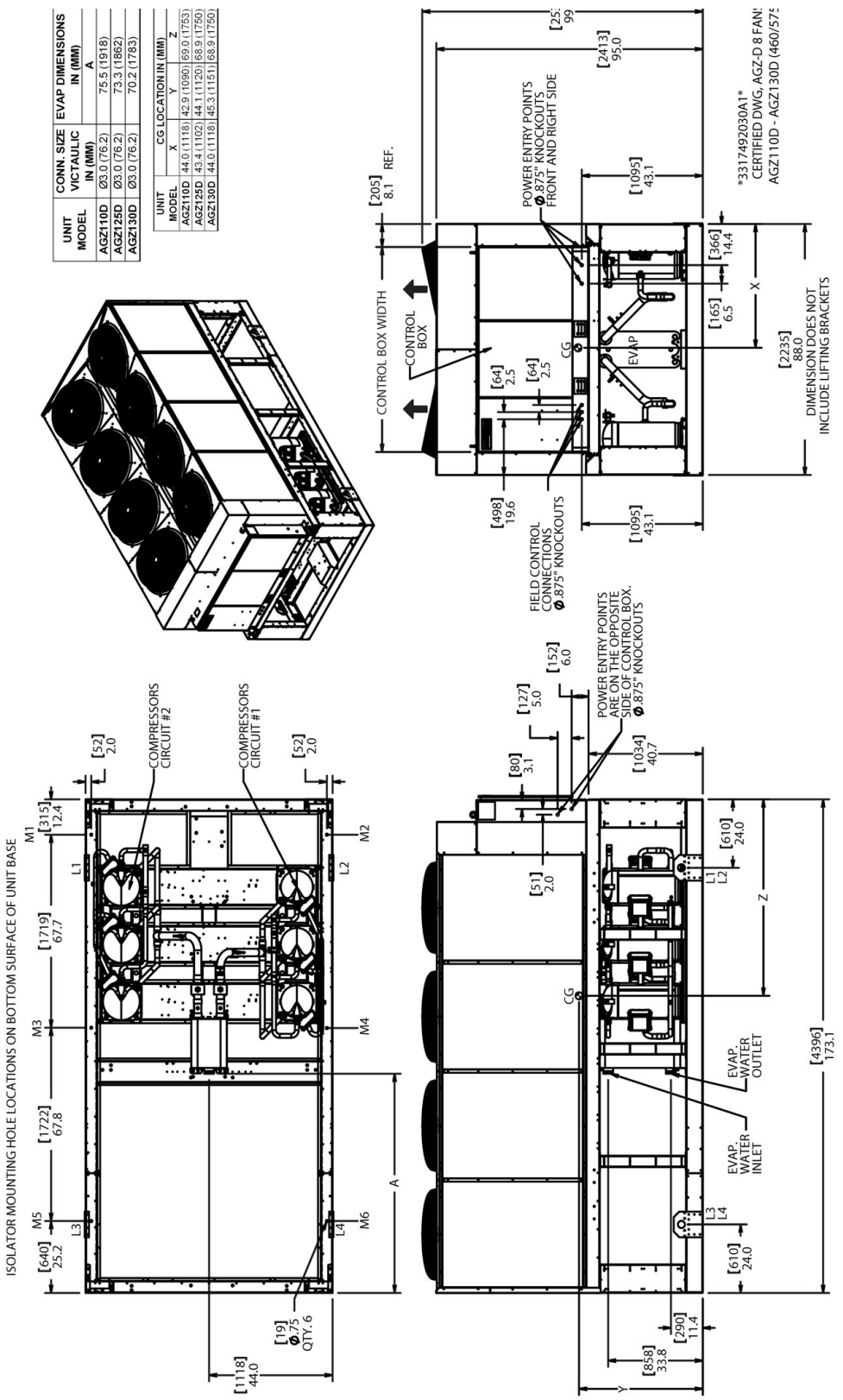


Figure 23: AGZ110DH - 130DH 460/575 volt models (208/230 previous page)



Dimensions

Figure 24: AGZ140DH - 180DH (Packaged)

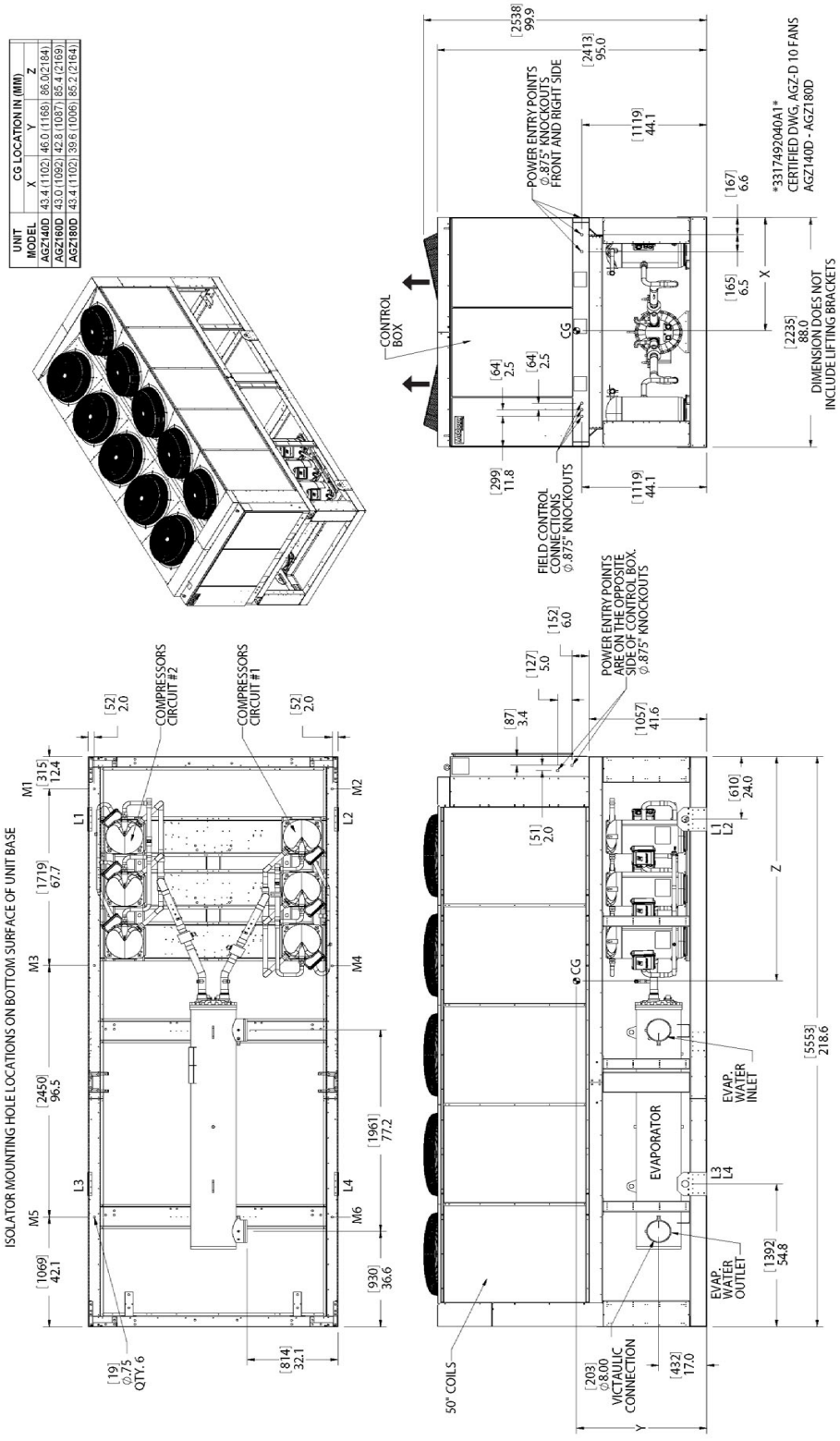
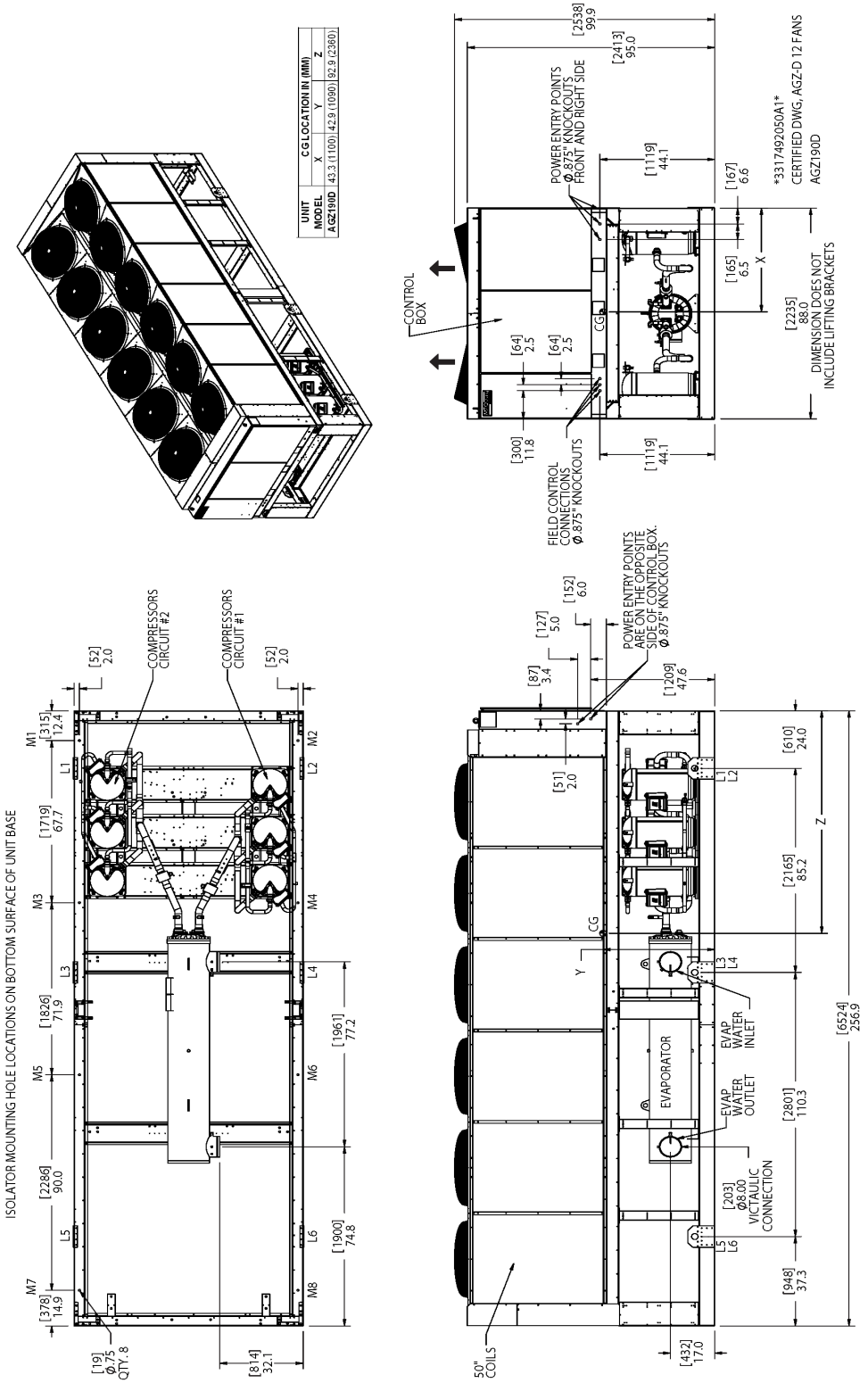


Figure 25: AGZ190DH (Packaged)



Lifting and Mounting Weights

Table 7: Lifting Locations

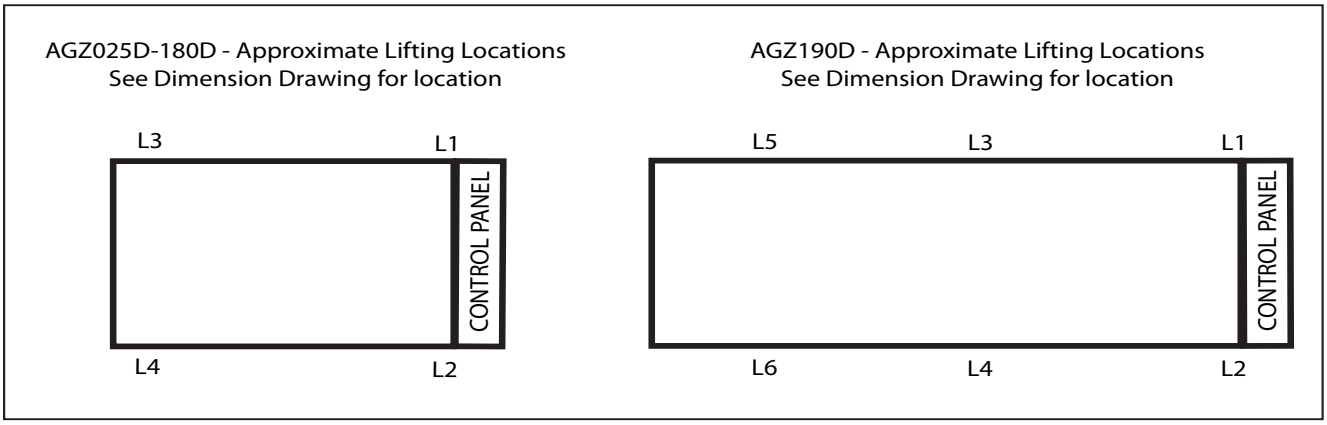
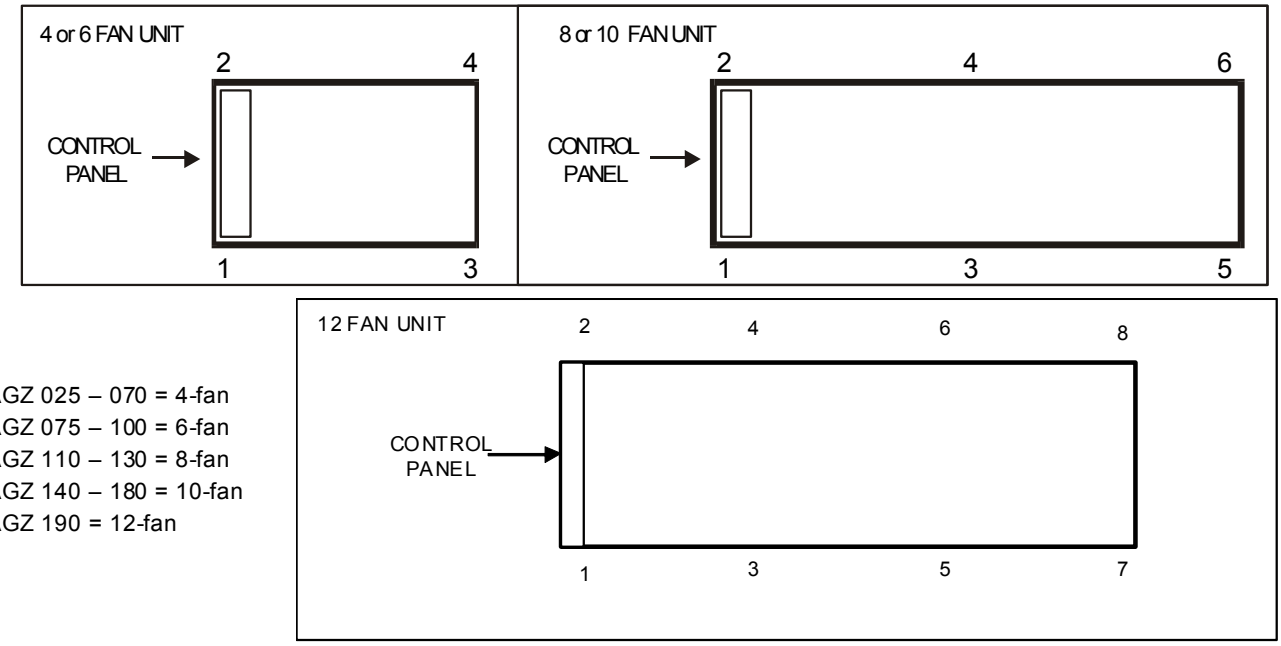


Table 8: Lifting Weights

UNIT MODEL	LIFTING WEIGHT BY CORNER LBS (KG)					
	L1	L2	L3	L4	L5	L6
AGZ025D	1053 (478)	806 (366)	729 (331)	561 (254)		
AGZ030D	1069 (485)	806 (366)	745 (338)	561 (254)		
AGZ035D	1070 (485)	810 (367)	743 (337)	562 (255)		
AGZ040D	1084 (492)	829 (376)	766 (347)	586 (266)		
AGZ045D	1116 (506)	871 (395)	805 (365)	628 (285)		
AGZ050D	1143 (518)	898 (407)	815 (370)	640 (290)		
AGZ055D	1150 (522)	908 (412)	820 (372)	647 (293)		
AGZ060D	1195 (542)	950 (431)	837 (380)	663 (301)		
AGZ065D	1200 (544)	963 (437)	840 (381)	671 (304)		
AGZ070D	1327 (602)	943 (428)	1063 (482)	752 (341)		
AGZ075D	1770 (803)	1740 (789)	965 (438)	950 (431)		
AGZ080D	1842 (836)	1842 (836)	916 (415)	915 (415)		
AGZ090D	1836 (833)	1800 (816)	994 (451)	975 (442)		
AGZ100D	1880 (853)	1843 (836)	1014 (460)	994 (451)		
AGZ110D (208/230V)	2325 (1055)	2325 (1055)	1290 (585)	1290 (585)		
AGZ110D (460/575V)	2297 (1042)	2300 (1043)	1286 (583)	1287 (584)		
AGZ125D (208/230V)	2430 (1102)	2365 (1073)	1350 (612)	1310 (594)		
AGZ125D (460/575V)	2405 (1091)	2340 (1061)	1344 (610)	1306 (592)		
AGZ130D (208/230V)	2440 (1107)	2440 (1107)	1355 (615	1355 (615)		
AGZ130D (460/575V)	2415 (1095)	2415 (1095)	1350 (612)	1350 (612)		
AGZ140D	2631 (1193)	2555 (1159)	2092 (949)	2032 (922)		
AGZ160D	2715 (1232)	2592 (1176)	2125 (964)	2029 (920)		
AGZ180D	2746 (1246)	2670 (1211)	2134 (968)	2075 (941)		
AGZ190D	2280 (1034)	2245 (1018)	1823 (827)	1795 (814)	1231 (558)	1212 (550)

Figure 26: Mounting Locations



AGZ 025 – 070 = 4-fan
AGZ 075 – 100 = 6-fan
AGZ 110 – 130 = 8-fan
AGZ 140 – 180 = 10-fan
AGZ 190 = 12-fan

Table 9: Isolator Loads at Each Mounting Location (with Aluminum Fins)

Unit Size	Fans (Qty)	Shipping Weight lbs (kg)	Operating Weight lbs (kg)	M1 lbs (kg)	M2 lbs (kg)	M3 lbs (kg)	M4 lbs (kg)	M5 lbs (kg)	M6 lbs (kg)	M7 lbs (kg)	M8 lbs (kg)	Copper Fin Weight Add - See Note
AGZ025D	4	3148 (1428)	3163 (1435)	1028 (466)	781 (354)	769 (349)	584 (265)	—	—	—	—	71 (32)
AGZ030D	4	3180 (1442)	3195 (1449)	1043 (473)	785 (356)	780 (354)	587 (266)	—	—	—	—	71 (32)
AGZ035D	4	3185 (1445)	3205 (1454)	1043 (473)	789 (358)	780 (354)	590 (268)	—	—	—	—	72 (33)
AGZ040D	4	3265 (1481)	3285 (1490)	1060 (481)	810 (367)	803 (364)	613 (278)	—	—	—	—	72 (33)
AGZ045D	4	3420 (1551)	3445 (1563)	1095 (497)	856 (388)	839 (381)	656 (297)	—	—	—	—	119 (54)
AGZ050D	4	3495 (1585)	3525 (1599)	1121 (509)	880 (399)	854 (387)	670 (304)	—	—	—	—	119 (54)
AGZ055D	4	3525 (1599)	3555 (1613)	1128 (512)	890 (404)	859 (390)	678 (307)	—	—	—	—	119 (54)
AGZ060D	4	3645 (1653)	3680 (1669)	1150 (522)	950 (431)	866 (393)	715 (324)	—	—	—	—	142 (65)
AGZ065D	4	3675 (1667)	3715 (1685)	1159 (526)	961 (436)	872 (396)	723 (328)	—	—	—	—	142 (65)
AGZ070D	4	4085 (1853)	4125 (1871)	1288 (584)	956 (434)	1079 (490)	801 (364)	—	—	—	—	142 (65)
AGZ075D	6	5425 (2461)	5470 (2481)	1697 (770)	1667 (756)	1063 (482)	1044 (473)	—	—	—	—	218 (99)
AGZ080D	6	5515 (2502)	5565 (2524)	1759 (798)	1759 (798)	1024 (464)	1024 (464)	—	—	—	—	218 (99)
AGZ090D	6	5605 (2542)	5660 (2567)	1761 (799)	1729 (784)	1095 (497)	1075 (488)	—	—	—	—	218 (99)
AGZ100D	6	5730 (2599)	5795 (2629)	1806 (819)	1773 (804)	1118 (507)	1098 (498)	—	—	—	—	218 (99)

Note: Weight Add for Copper fins is per mounting location

Lifting and Mounting Weights

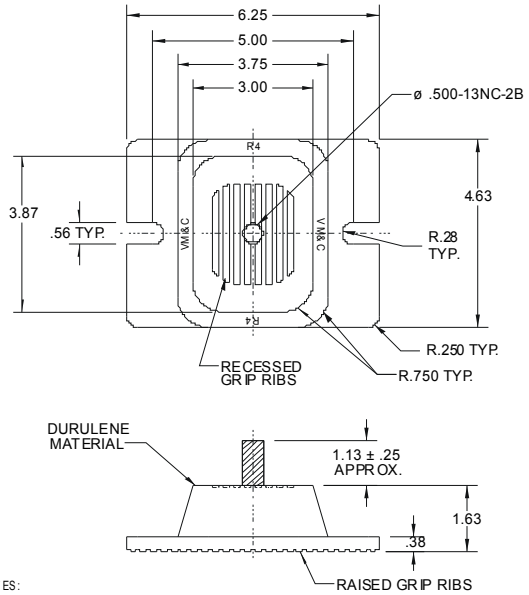
Table 10: Isolator Loads at Each Mounting Location (with Aluminum Fins) (continued)

Unit Size	Parts (Qty)	Weight lbs (kg)	Weight lbs (kg)	M1 lbs (kg)	M2 lbs (kg)	M3 lbs (kg)	M4 lbs (kg)	M5 lbs (kg)	M6 lbs (kg)	M7 lbs (kg)	M8 lbs (kg)	Copper Fin Weight Add - See Note
AGZ110D 460-575V	8	7170 (3252)	7240 (3284)	1504 (682)	1504 (682)	1207 (547)	1207 (547)	909 412	909 412	—	—	193 (87)
AGZ110D 208-230V	8	7230 (3279)	7300 (3311)	1517 (688)	1517 (688)	1217 (552)	1217 (552)	917 416	917 416	—	—	193 (87)
AGZ125D 460-575V	8	7395 (3354)	7475 (3391)	1577 (715)	1534 (696)	1263 (573)	1229 (558)	949 430	923 419	—	—	193 (87)
AGZ125D 208-230V	8	7455 (3382)	7535 (3418)	1590 (721)	1547 (702)	1273 (578)	1239 (562)	956 434	931 422	—	—	193 (87)
AGZ130D 460-575V	8	7530 (3416)	7620 (3456)	1586 (719)	1586 (719)	1270 (576)	1270 (576)	954 433	954 433	—	—	193 (87)
AGZ130D 208-230V	8	7590 (3443)	7680 (3484)	1598 (725)	1598 (725)	1280 (581)	1280 (581)	962 436	962 436	—	—	193 (87)
AGZ140D	10	9310 (4223)	9792 (4442)	1759 (798)	1711 (776)	1667 (756)	1622 (736)	1537 697	1496 678	—	—	266 (121)
AGZ160D	10	9460 (4291)	9942 (4510)	1819 (825)	1738 (788)	1710 (776)	1634 (741)	1555 705	1486 674	—	—	266 (121)
AGZ180D	10	9625 (4366)	10107 (4584)	1838 (834)	1789 (811)	1724 (782)	1677 (761)	1560 708	1518 689	—	—	266 (121)
AGZ190D	12	10585 (4801)	11070 (5021)	2013 (913)	1950 (884)	1637 (742)	1585 (719)	1237 561	1198	737 334	714 324	239 (109)

Note: Weight Add for Copper fins is per mounting location

Figure 27: Sping and RIS Isolators

RP-4 Rubber-in-Shear (RIS)



NOTES:

1. MOUNT MATERIAL TO BE DURULENE RUBBER.
2. MOLDED STEEL AND ELASTOMER MOUNT FOR OUTDOOR SERVICE CONDITIONS.
3. RP-4 MOUNT VERSION WITH STUD IN PLACE.

DRAWING NUMBER 3314814

ALL DIMENSIONS ARE IN DECIMAL INCHES

CP-2 Spring Isolator

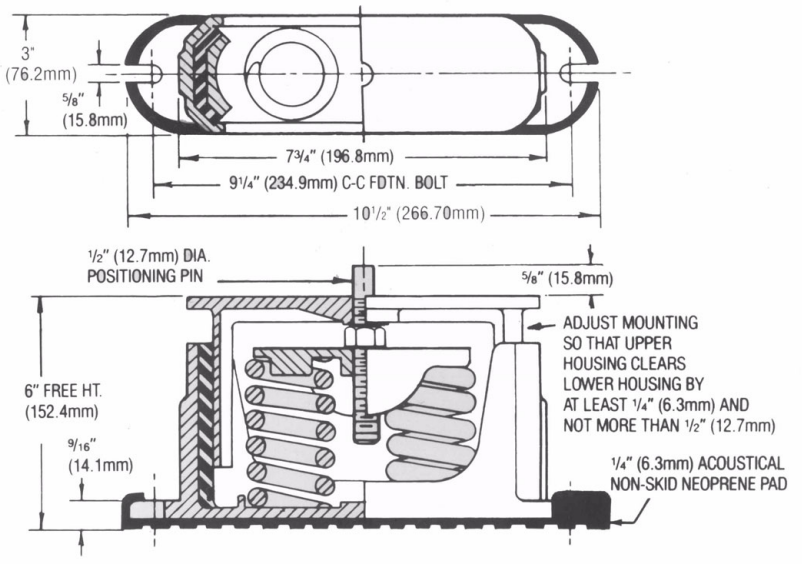

3" (76.2mm)
5/8" (15.8mm)
7 3/4" (196.8mm)
9 1/4" (234.9mm) C-C FDTN. BOLT
10 1/2" (266.70mm)
1/2" (12.7mm) DIA. POSITIONING PIN
5/8" (15.8mm)
ADJUST MOUNTING SO THAT UPPER HOUSING CLEARS LOWER HOUSING BY AT LEAST 1/4" (6.3mm) AND NOT MORE THAN 1/2" (12.7mm)
6" FREE HT. (152.4mm)
9/16" (14.1mm)
1/4" (6.3mm) ACOUSTICAL NON-SKID NEOPRENE PAD

Table 11: Kit Numbers

Spring Isolator Kit Numbers

AGZ-D Model	Packaged Unit	
	Aluminum Fins	Copper Fins
025	332320101	332320101
030	332320101	332320101
035	332320101	332320101
040	332320101	332320101
045	332320101	332320109
050	332320101	332320109
055	332320101	332320109
060	332320102	332320103
065	332320102	332320110
070	332320103	332320110
075	332320104	332320105
080	332320105	332320105
090	332320105	332320105
100	332320105	332320105
110	332320106	332320111
125	332320106	332320111
130	332320106	332320111
140	332320107	332320112
160	332320107	332320112
180	332320107	332320112
190	332320108	332320113

R-I-S Isolator Kit Numbers

AGZ-D Model	Packaged Unit	
	Aluminum Fins	Copper Fins
25	332325101	332325101
30	332325101	332325101
35	332325101	332325101
40	332325101	332325101
45	332325101	332325101
50	332325101	332325101
55	332325101	332325101
60	332325101	332325101
65	332325101	332325101
70	332325101	332325102
75	332325102	332325102
80	332325102	332325102
90	332325102	332325102
100	332325102	332325102
110	332325103	332325103
125	332325103	332325103
130	332325103	332325103
140	332325104	332325104
160	332325104	332325104
180	332325104	332325104
190	332325105	332325106

Lifting and Mounting Weights

Table 12: Isolator Locations (Aluminum Fins)

AGZ-D	Rubber-In-Shear (RIS) Mounts								Spring Isolator Mountings							
Model	M1	M2	M3	M4	M5	M6	M7	M8	M1	M2	M3	M4	M5	M6	M7	M8
025	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
030	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
035	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
040	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
045	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
050	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
055	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
060	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Dark Prpl	CP-2 Black	CP-2 Black				
065	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Dark Prpl	CP-2 Black	CP-2 Black				
070	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Prpl e				
075	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Prpl	CP-2 Dark Prpl le				
080	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown					CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn				
090	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown					CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn				
100	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown					CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn				
110	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown			CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Prpl	CP-2 Dark Prpl		
120	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown			CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Prpl	CP-2 Dark Prpl		
130	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown			CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Prpl	CP-2 Dark Prpl		
140	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red			CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn		
160	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red			CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn		
180	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red			CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn		
190	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown	CP-2 Gray	CP-2 Gray	CP-2 Dark Green	CP-2 Dark Green	CP-2 Dark Green	CP-2 Dark Green	CP-2 Black	CP-2 Black

Table 13: Isolator Locations (Copper Fins)

AGZ-D Model	Rubber-In-Shear (RIS) Mounts								Spring Isolator Mountings							
	M1	M2	M3	M4	M5	M6	M7	M8	M1	M2	M3	M4	M5	M6	M7	M8
025	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
030	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
035	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
040	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Black	CP-2 Black	CP-2 Black				
045	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Black				
050	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Black				
055	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Black				
060	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Purple				
065	RP-4 Brown	RP-4 Brown	RP-4 Brown	RP-4 Brown					CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn				
070	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown					CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn				
075	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown					CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn				
080	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown					CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn				
090	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown					CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn				
100	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown					CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn				
110	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown			CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn		
120	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown			CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn n	CP-2 Dark Grn	CP-2 Dark Grn		
130	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brown	RP-4 Brown			CP-2 Gray	CP-2 Gray	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn	CP-2 Dark Grn		
140	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red			CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray		
160	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red			CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray		
180	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red			CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray		
190	RP-4 Lime	RP-4 Lime	RP-4 Lime	RP-4 Lime	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	RP-4 Brick Red	CP-2 White	CP-2 White	CP-2 White	CP-2 White	CP-2 Gray	CP-2 Gray	CP-2 Gray	CP-2 Gray

Physical Data

Table 14: Physical Data - AGZ025D - AGZ040D

PHYSICAL DATA	AGZ-D MODEL NUMBER							
	25		30		35		40	
BASIC DATA	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**
Unit Capacity @ AHRI Conditions (See Note 1), Tons (kW)	27 (96)		32 (111)		35 (123)		38 (133)	
Number Of Refrigerant Circuits	2		2		2		2	
Unit Operating Charge, R-410A, lbs (kg)	28 (13)	28 (13)	32 (15)	32 (15)	32 (15)	32 (15)	39 (17)	39 (17)
Cabinet Dimensions, L x W x H, in. (mm)	94.4 x 88.0 x 100.4 (2398 x 2235 x 2550)		94.4 x 88.0 x 100.4 (2398 x 2235 x 2550)		94.4 x 88.0 x 100.4 (2398 x 2235 x 2550)		94.4 x 88.0 x 100.4 (2398 x 2235 x 2550)	
Unit Operating Weight, lbs (kg)	3163 (1435)		3195 (1449)		3205 (1454)		3285 (1490)	
Unit Shipping Weight, lbs (kg)	3148 (1428)		3180 (1442)		3185 (1445)		3265 (1481)	
Add'l Weight for Copper Finned Coils, lbs (kg)	284 (129)		284 (129)		288 (130)		288 (130)	
COMPRESSORS								
Type	Tandem Scrolls		Tandem Scrolls		Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	7.5	7.5	8.5	8.5	8.5	10	10	10
Number Of Compressors per Circuit	2	2	2	2	2	2	2	2
Oil Charge Per Compressor, oz (g)	85 (2410)	85 (2410)	110 (3119)	110 (3119)	110 (3119)	110 (3119)	110 (3119)	110 (3119)
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT								
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		0-25-50-75-100		23-50-73-100		0-25-50-75-100	
Staging, 4 Stages, Circuit #2 in Lead	0-25-50-75-100		0-25-50-75-100		27-50-73-100		0-25-50-75-100	
CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING								
Coil Face Area, ft^2	26.3	26.3	26.3	26.3	26.3	26.3	44.1	44.1
Coil Face Area, (m^2)	2.4	2.4	2.4	2.4	2.4	2.4	4.1	4.1
Finned Height x Finned Length, in. (mm)	50x75.6 (1270x1920)	50x75.6 (1270x1920)	50x75.6 (1270x1920)	50x75.6 (1270x1920)	50x75.6 (1270x1920)	50x75.6 (1270x1920)	42x75.6 (1067x1920)	42x75.6 (1067x1920)
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 2	16 x 2
Pumpdown Capacity, 90% Full lbs (kg)	40 (18)	40 (18)	40 (18)	40 (18)	40 (18)	40 (18)	47 (21)	47 (21)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE								
Number Of Fans - Fan Diameter, in. (mm)	4 – 30 (762)		4 – 30 (762)		4 – 30 (762)		4 – 30 (762)	
Number Of Motors - HP (kW) (Note 2)	4 – 1.5 (1.1)		4 – 1.5 (1.1)		4 – 1.5 (1.1)		4 – 1.5 (1.1)	
Fan And Motor RPM, 60Hz	1140		1140		1140		1140	
60 Hz Fan Tip Speed, FPM (m/sec)	8950 (45)		8950 (45)		8950 (45)		8950 (45)	
60 Hz Total Unit Airflow, CFM (l/sec)	24,316 (11,478)		24,316 (11,478)		24,316 (11,478)		39,600 (18,692)	
EVAPORATOR - BRAZED PLATE-TO-PLATE								
Number of Evaporators	1		1		1		1	
Number of Refrigerant Circuits	2		2		2		2	
Water Volume, Gallons, (l)	2.01 (7.6)		2.01 (7.6)		2.22 (8.4)		2.43 (9.2)	
Maximum Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Max. Refrig. Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Conn. in. (mm)	2.5 (65)		2.5 (65)		2.5 (65)		2.5 (65)	
Drain - NPT int, in. (mm) (Note 4)	Field Piping		Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm) (Note 4)	Field Piping		Field Piping		Field Piping		Field Piping	

Note 1: Nominal capacity based on 95° F ambient air and 54° F/44° F water range.

Note 2: For all 380V/60 & 575V/60 models, HP = 2.0.

Note 3: Water connection shown is nominal pipe size.

Note 4: Brazed plate evaporators do not have drain or vent connections integral to the heat exchanger. The connections must be installed in the field inlet and outlet piping as shown in Piping Section beginning on page 9.

Table 15: Physical Data - AGZ045D - AGZ060D

PHYSICAL DATA	AGZ-D MODEL NUMBER							
	45		50		55		60	
BASIC DATA	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**
Unit Capacity @ AHRI Conditions (See Note 1), Tons (kW)	43 (150)		48 (169)		52 (181)		56 (197)	
Number Of Refrigerant Circuits	2		2		2		2	
Unit Operating Charge, R-410A, lbs (kg)	44 (20)	44 (20)	50 (23)	50 (23)	52 (24)	52 (24)	54 (25)	54 (25)
Cabinet Dimensions, L x W x H, in. (mm)	94.4 x 88.0 x 100.4 (2398 x 2235 x 2550)		94.4 x 88.0 x 100.4 (2398 x 2235 x 2550)		94.4 x 88.0 x 100.4 (2398 x 2235 x 2550)		94.4 x 88.0 x 100. (2398 x 2235 x 2550)	
Unit Operating Weight, lbs (kg)	3445 (1563)		3525 (1599)		3555 (1613)		3680 (1670)	
Unit Shipping Weight, lbs (kg)	3420 (1551)		3495 (1585)		3525 (1599)		3645 (1639)	
Add'l Weight for Copper Finned Coils, lbs (kg)	476 (216)		476 (216)		476 (216)		568 (258)	
COMPRESSORS								
Type	Tandem Scrolls		Tandem Scrolls		Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	11.5	11.5	13	13	13	15	15	15
Number Of Compressors per Circuit	2	2	2	2	2	2	2	2
Oil Charge Per Compressor, oz (g)	110 (3119)	110 (3119)	110 (3119)	110 (3119)	110 (3119)	110 (3119)	110 (3119)	110 (3119)
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT								
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		0-25-50-75-100		0-23-50-73-100		0-25-50-75-100	
Staging, 4 Stages, Circuit #2 in Lead	0-25-50-75-100		0-25-50-75-100		0-27-50-77-100		0-25-50-75-100	
CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING								
Coil Face Area, ft^2	44.1	44.1	44.1	44.1	44.1	44.1	44.1	44.1
Coil Face Area, (m^2)	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Finned Height x Finned Length, in. (mm)	42x75.6 (1067x1920)	42x75.6 (1067x1920)	42x75.6 (1067x1920)	42x75.6 (1067x1920)	42x75.6 (1067x1920)	42x75.6 (1067x1920)	42x75.6 (1067x1920)	42x75.6 (1067x1920)
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3
Pumpdown Capacity, 90% Full lbs (kg)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)	69 (31)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE								
Number Of Fans - Fan Diameter, in. (mm)	4 – 30 (762)		4 – 30 (762)		4 – 30 (762)		4 – 30 (762)	
Number Of Motors - HP (kW) (Note 2)	4 – 1.5 (1.1)		4 – 1.5 (1.1)		4 – 1.5 (1.1)		4 – 1.5 (1.1)	
Fan And Motor RPM, 60Hz	1140		1140		1140		1140	
60 Hz Fan Tip Speed, FPM (m/sec)	8950 (45)		8950 (45)		8950 (45)		8950 (45)	
60 Hz Total Unit Airflow, CFM (l/sec)	37,228 (17,572)		37,228 (17,572)		37,228 (17,572)		37,228 (17,572)	
EVAPORATOR - BRAZED PLATE-TO-PLATE								
Number of Evaporators	1		1		1		1	
Number of Refrigerant Circuits	2		2		2		2	
Water Volume, Gallons, (l)	2.85 (10.8)		3.28 (12.4)		3.49 (13.2)		4.04 (15.3)	
Maximum Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Maximum Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Connections, in. (mm)	2.5 (65)		2.5 (65)		2.5 (65)		3 (80)	
Drain - NPT int, in. (mm) (Note 4)	Field Piping		Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm) (Note 4)	Field Piping		Field Piping		Field Piping		Field Piping	

Note 1: Nominal capacity based on 95° F ambient air and 54° F/44° F water range.

Note 2: For all 380V/60 & 575V/60 models, HP = 2.0.

Note 3: Water connection shown is nominal pipe size.

Note 4: Brazed plate evaporators do not have drain or vent connections integral to the heat exchanger. The connections must be installed in the field inlet and outlet piping as shown in Piping Section beginning on page 9.

Physical Data

Table 16: Physical Data - AGZ065D - AGZ070D

PHYSICAL DATA	AGZ-D MODEL NUMBER			
	65		70	
BASIC DATA	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**
Unit Capacity @ AHRI Conditions (See Note 1), Tons (kW)	58 (204)		64 (225)	
Number Of Refrigerant Circuits	2		2	
Unit Operating Charge, R-410A, lbs (kg)	58 (26)	58 (26)	60 (27)	60 (27)
Cabinet Dimensions, L x W x H, in. (mm)	94.4 x 88.0 x 100.4 (2398 x 2235 x 2550)		94.4 x 88.0 x 100.4 (2398 x 2235 x 2550)	
Unit Operating Weight, lbs (kg)	3715 (1683)		4125 (1869)	
Unit Shipping Weight, lbs (kg)	3675 (1665)		4085 (1851)	
Add'l Weight for Copper Finned Coils, lbs (kg)	568 (258)		568 (258)	
COMPRESSORS				
Type	Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	15	15	15/20	15/20
Number Of Compressors per Circuit	2	2	2	2
Oil Charge Per Compressor, oz (g)	110 (3119)	110 (3119)	110/158 3119/4479	110/158 3119/4479
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT				
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		0-21-50-71-100	
Staging, 4 Stages, Circuit #2 in Lead	0-25-50-75-100		0-28-50-78-100	
CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING				
Coil Face Area, ft^2	52.6	52.6	52.6	52.6
Coil Face Area, (m^2)	4.9	4.9	4.9	4.9
Finned Height x Finned Length, in. (mm)	50x75.6 (1270x1920)	50x75.6 (1270x1920)	50x75.6 (1270x1920)	50x75.6 (1270x1920)
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3
Pumpdown Capacity, 90% Full lbs (kg)	81 (37)	81 (37)	81 (37)	81 (37)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE				
Number Of Fans - Fan Diameter, in. (mm)	4 – 30 (762)		4 – 30 (762)	
Number Of Motors - HP (kW) (2)	4 – 2.0 (1.5)		4 – 2.0 (1.5)	
Fan And Motor RPM, 60Hz	1140		1140	
60 Hz Fan Tip Speed, FPM (m/sec)	8950 (45)		8950 (45)	
60 Hz Total Unit Airflow, CFM (l/sec)	43,452 (20,510)		43,452 (20,510)	
EVAPORATOR - BRAZED PLATE-TO-PLATE				
Number of Evaporators	1		1	
Number of Refrigerant Circuits	2		2	
Water Volume, Gallons, (l)	4.76 (18.0)		4.76 (18.0)	
Maximum Water Pressure, psig (kPa)	653 (4502)		653 (4502)	
Maximum Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Connections, in. (mm)	3 (80)		3 (80)	
Drain - NPT int, in. (mm) (Note 4)	Field Piping		Field Piping	
Vent - NPT int, in. (mm) (Note 4)	Field Piping		Field Piping	

Note 1: Nominal capacity based on 95° F ambient air and 54° F/44° F water range.

Note 2: For all 380V/60 & 575V/60 models, HP = 2.0.

Note 3: Water connection shown is nominal pipe size.

Note 4: Brazed plate evaporators do not have drain or vent connections integral to the heat exchanger. The connections must be installed in the field inlet and outlet piping as shown in Piping Section beginning on page 9.

Table 17: Physical Data - AGZ075D - AGZ100D

PHYSICAL DATA	AGZ-D MODEL NUMBER							
	75		80		90		100	
BASIC DATA	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**
Unit Capacity @ AHRI Conditions (See Note 1), Tons (kW)	73 (257)		81 (285)		89 (314)		100 (351)	
Number Of Refrigerant Circuits	2		2		2		2	
Unit Operating Charge, R-410A, lbs (kg)	75 (34)	75 (34)	80 (36)	80 (36)	86 (39)	86 (39)	88 (40)	88 (40)
Cabinet Dimensions, L x W x H, in. (mm)	134.9 x 88.0 x 100.4 (3426 x 2235 x 2550)		134.9 x 88.0 x 100.4 (3426 x 2235 x 2550)		134.9 x 88.0 x 100.4 (3426 x 2235 x 2550)		134.9 x 88.0 x 100.4 (3426 x 2235 x 2550)	
Unit Operating Weight, lbs (kg)	5470 (2478)		5565 (2521)		5660 (2564)		5795 (2625)	
Unit Shipping Weight, lbs (kg)	5425 (2458)		5515 (2498)		5605 (2539)		5730 (2596)	
Add'l Weight for Copper Finned Coils, lbs (kg)	870 (395)		870 (395)		870 (395)		870 (395)	
COMPRESSORS								
Type	Tandem Scrolls		Tandem Scrolls		Tandem Scrolls		Tandem Scrolls	
Nominal tonnage of each Compressor	20	20	20	25	25	25	25/30	25/30
Number Of Compressors per Circuit	2	2	2	2	2	2	2	2
Oil Charge Per Compressor, oz (g)	158 (4479)	158 (4479)	158 (4479)	230 (6520)	230 (6520)	230 (6520)	230/213 6520/6038	230/213 6520/6038
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT								
Staging, 4 Stages, Circuit #1 in Lead	0-25-50-75-100		0-22-50-72-100		0-25-50-75-100		0-22-50-72-100	
Staging, 4 Stages, Circuit #2 in Lead	0-25-50-75-100		0-28-50-78-100		0-25-50-75-100		0-22-50-72-100	
CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING								
Coil Face Area, ft^2	66.2	66.2	66.2	66.2	78.8	78.8	78.8	78.8
Coil Face Area, (m^2)	6.1	6.1	6.1	6.1	7.3	7.3	7.3	7.3
Finned Height x Finned Length, in. (mm)	42 x113.4 (1069x2880)	42 x113.4 (1069x2880)	42 x113.4 (1069x2880)	42 x113.4 (1069x2880)	50 x113.4 (1270x2880)	50 x113.4 (1270x2880)	50 x113.4 (1270x2880)	50 x113.4 (1270x2880)
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3
Pumpdown Capacity, 90% Full lbs (kg)	111 (50)	111 (50)	111 (50)	111 (50)	130 (59)	130 (59)	130 (59)	130 (59)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE								
Number Of Fans - Fan Diameter, in. (mm)	6 – 30 (762)		6 – 30 (762)		6 – 30 (762)		6 – 30 (762)	
Number Of Motors - HP (kW)	6 – 2.0 (1.5)		6 – 2.0 (1.5)		6 – 2.0 (1.5)		6 – 2.0 (1.5)	
Fan And Motor RPM, 60Hz	1140		1140		1140		1140	
60 Hz Fan Tip Speed, FPM (m/sec)	8950 (45)		8950 (45)		8950 (45)		8950 (45)	
60 Hz Total Unit Airflow, CFM (l/sec)	61,200 (28,888)		61,200 (28,888)		65,178 (30,765)		65,178 (30,765)	
EVAPORATOR – BRAZED PLATE-TO-PLATE								
Number of Evaporators	1		1		1		1,	
Number of Refrigerant Circuits	2		2		2		2	
Water Volume, Gallons, (l)	5.47 (20.7)		6.18 (23.4)		6.66 (25.2)		7.85 (29.7)	
Max. Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Max. Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)		653 (4502)	
Water Inlet/Outlet Victaulic Conn. in. (mm)	3 (80)		3 (80)		3 (80)		3 (80)	
Drain - NPT int, in. (mm) (Note 3)	Field Piping		Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm) (Note 3)	Field Piping		Field Piping		Field Piping		Field Piping	

Note 1: Nominal capacity based on 95° F ambient air and 54° F/44° F water range.

Note 2: For all 380V/60 & 575V/60 models, HP = 2.0.

Note 3: Water connection shown is nominal pipe size.

Note 4: Brazed plate evaporators do not have drain or vent connections integral to the heat exchanger. The connections must be installed in the field inlet and outlet piping as shown in Piping Section beginning on page 9.

Physical Data

Table 18: Physical Data - AGZ110D - AGZ130D

PHYSICAL DATA	AGZ-D MODEL NUMBER					
	110		125		130	
BASIC DATA	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**
Unit Capacity @ AHRI Conditions (See Note 1), Tons (kW)	106 (373)		117 (412)		130 (456)	
Number Of Refrigerant Circuits	2		2		2	
Unit Operating Charge, R-410A, lbs (kg)	102 (46)	102 (46)	115 (52)	115 (52)	115 (52)	115 (52)
Cabinet Dimensions, L x W x H, in. (mm)	173.1 x 88.0 x 100.4 (4397 x 2235 x 2550)		173.1 x 88.0 x 100.4 (4397 x 2235 x 2550)		173.1 x 88.0 x 100.4 (4397 x 2235 x 2550)	
Unit Operating Weight, lbs (kg)	7300 (3307)		7535 (3413)		7680 (3479)	
Unit Shipping Weight, lbs (kg)	7230 (3275)		7455 (3377)		7590 (3438)	
Add'l Weight for Copper Finned Coils, lbs (kg)	1155 (524)		1155 (524)		1155 (524)	
COMPRESSORS						
Type	Trio Scrolls		Trio Scrolls		Trio Scrolls	
Nominal tonnage of each Compressor	20	20	20	25	25	25
Number Of Compressors per Circuit	3	3	3	3	3	3
Oil Charge Per Compressor, oz (g)	158 (4479)	158 (4479)	158 (4479)	230 (6520)	230 (520)	230 (6520)
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT						
Staging, 6 Stages, Circuit #1 in Lead	0-17-33-50-67-83-100		0-15-33-48-67-81-100		0-17-33-50-67-83-100	
Staging, 6 Stages, Circuit #2 in Lead	0-17-33-50-67-83-100		0-19-33-52-67-86-100		0-17-33-50-67-83-100	
CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING						
Coil Face Area, ft^2	88.4	88.4	105.3	105.3	105.3	105.3
Coil Face Area, (m^2)	8.2	8.2	9.8	9.8	9.8	9.8
Finned Height x Finned Length, in. (mm)	42 x151.6 (1069x3851)	42 x151.6 (1069x3851)	50 x151.6 (1270x3851)	50 x151.6 (1270x3851)	50 x151.6 (1270x3851)	50 x151.6 (1270x3851)
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3
Pumpdown Capacity, 90% Full lbs (kg)	142/64	142/64	166/75	166/75	166/75	166/75
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE						
Number Of Fans - Fan Diameter, in. (mm)	8 – 30 (762)		8 – 30 (762)		8 – 30 (762)	
Number Of Motors - HP (kW)	8 – 2.0 (1.5)		8 – 2.0 (1.5)		8 – 2.0 (1.5)	
Fan And Motor RPM, 60Hz	1140		1140		1140	
60 Hz Fan Tip Speed, FPM (m/sec)	8950 (45)		8950 (45)		8950 (45)	
60 Hz Total Unit Airflow, CFM (l/sec)	81,600 (38,517)		86,904 (41,020)		86,904 (41,020)	
EVAPORATOR – BRAZED PLATE-TO-PLATE						
Number of Evaporators	1		1		1	
Number of Refrigerant Circuits	2		2		2	
Water Volume, Gallons, (l)	8.32 (31.5)		9.51 (36.0)		10.7 (40.5)	
Max. Water Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Max. Refrigerant Working Pressure, psig (kPa)	653 (4502)		653 (4502)		653 (4502)	
Water Inlet / Outlet Victaulic Conn, in. (mm)	3 (80)		3 (80)		3 (80)	
Drain - NPT int, in. (mm) (Note 3)	Field Piping		Field Piping		Field Piping	
Vent - NPT int, in. (mm) (Note 3)	Field Piping		Field Piping		Field Piping	

Note 1: Nominal capacity based on 95° F ambient air and 54° F/44° F water range.

Note 2: For all 380V/60 & 575V/60 models, HP = 2.0.

Note 3: Water connection shown is nominal pipe size.

Note 4: Brazed plate evaporators do not have drain or vent connections integral to the heat exchanger. The connections must be installed in the field inlet and outlet piping as shown in Piping Section beginning on page 9.

Table 19: Physical Data - AGZ140D - AGZ190D

PHYSICAL DATA	AGZ-D MODEL NUMBER							
	140		160		180		190	
BASIC DATA	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**	**Ckt.1**	**Ckt.2**
Unit Capacity @ AHRI (See Note 1), Tons (kW)	136 (479)		153 (539)		172 (605)		180 (633)	
Number Of Refrigerant Circuits	2		2		2		2	
Unit Operating Charge, R-410A, lbs (kg)	125 (57)	125 (57)	130 (59)	130 (59)	130 (59)	130 (59)	140 (64)	140 (64)
Cabinet Dimensions, L x W x H, in. (mm)	218.6 x 88.0 x 100.4 (5552 x 2235 x 2545)		218.6 x 88.0 x 100.4 (5552 x 2235 x 2545)		218.6 x 88.0 x 100.4 (5552 x 2235 x 2545)		256.9 x 88.0 x 100.4 (6525 x 2235 x 2545)	
Unit Operating Weight, lbs (kg)	9792(4436)		9942 (4504)		10107 (4578)		11070 (5015)	
Unit Shipping Weight, lbs (kg)	9310 (4217)		9460 (4285)		9625 (4360)		10585 (4795)	
Add'l Weight for Copper Finned Coils, lbs (kg)	1596 (724)		1596 (724)		1596 (724)		1915 (869)	
COMPRESSORS								
Type	Triple Scrolls		Triple Scrolls		Triple Scrolls		Triple Scrolls	
Nominal tonnage of each Compressor	25	25	25	30	30	30	30	30
Number Of Compressors per Circuit	3	3	3	3	3	3	3	3
Oil Charge Per Compressor, oz (g)	230 (6520)	230 (6520)	230 (6520)	213 (6038)	213 (6038)	213 (6038)	213 (6038)	213 (6038)
CAPACITY REDUCTION STEPS - PERCENT OF COMPRESSOR DISPLACEMENT								
Staging, 6 Stages, Circuit #1 in Lead	0-17-33-50-67-83-100		0-15-33-48-67-81-100		0-17-33-50-67-83-100		0-17-33-50-67-83-100	
Staging, 6 Stages, Circuit #2 in Lead	0-17-33-50-67-83-100		0-19-33-52-67-86-100		0-17-33-50-67-83-100		0-17-33-50-67-83-100	
CONDENSERS - HIGH EFFICIENCY FIN AND TUBE TYPE WITH INTEGRAL SUBCOOLING								
Coil Face Area, ft^2	131.8	131.8	131.8	131.8	131.8	131.8	158.3	158.3
Coil Face Area, (m^2)	12.2	12.2	12.2	12.2	12.2	12.2	14.7	14.7
Finned Height x Finned Length, in. (mm)	50 x 190 (1270x4821)	50 x 190 (1270x4821)	50 x 190 (1270x4821)	50 x 190 (1270x4821)	50 x 190 (1270x4821)	50 x 190 (1270x4821)	50 x 228 (1270x5791)	50 x 228 (1270x5791)
Fins Per Inch x Rows Deep	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3	16 x 3
Pumpdown Capacity, 90% Full lbs (kg)	202 (92)	202 (92)	202 (92)	202 (92)	202 (92)	202 (92)	242 (110)	242 (110)
CONDENSER FANS - DIRECT DRIVE PROPELLER TYPE								
Number Of Fans - Fan Diameter, in. (mm)	10 – 30 (762)		10 – 30 (762)		10 – 30 (762)		12 – 30 (762)	
Number Of Motors - HP (kW)	10 – 2.0 (1.5)		10 – 2.0 (1.5)		10 – 2.0 (1.5)		12 - 2.0 (1.5)	
Fan And Motor RPM, 60Hz	1140		1140		1140		1140	
60 Hz Fan Tip Speed, FPM (m/sec)	8950 (45)		8950 (45)		8950 (45)		8950 (45)	
60 Hz Total Unit Airflow, CFM (l/sec)	108,630 (51,268)		108,630 (51,268)		108,630 (51,268)		130,356 (61,522)	
EVAPORATOR - SHELL-AND-TUBE								
Number of Evaporators	1		1		1		1	
Number of Refrigerant Circuits	2		2		2		2	
Water Volume, Gallons, (l)	60 (227)		60 (227)		58 (219)		57 (215)	
Maximum Water Pressure, psig (kPa)	152 (1048)		152 (1048)		152 (1048)		152 (1048)	
Max. Refrig. Working Pressure, psig (kPa)	450 (3103)		450 (3103)		450 (3103)		450 (3103)	
Water Inlet / Outlet Victaulic Conn. in. (mm)	8.0 (200)		8.0 (200)		8.0 (200)		8.0 (200)	
Drain - NPT int, in.	½-in. NPTF		½-in. NPTF		½-in. NPTF		½-in. NPTF	
Vent - NPT int, in.	½-in. NPTF		½-in. NPTF		½-in. NPTF		½-in. NPTF	

Note 1: Nominal capacity based on 95° F ambient air and 54° F/44° F water range.
Note 2: For all 380V/60 & 575V/60 models, HP = 2.0.
Note 3: Water connection shown is nominal pipe size.

Pressure Drop Data

Figure 28: Pressure Drop Curves

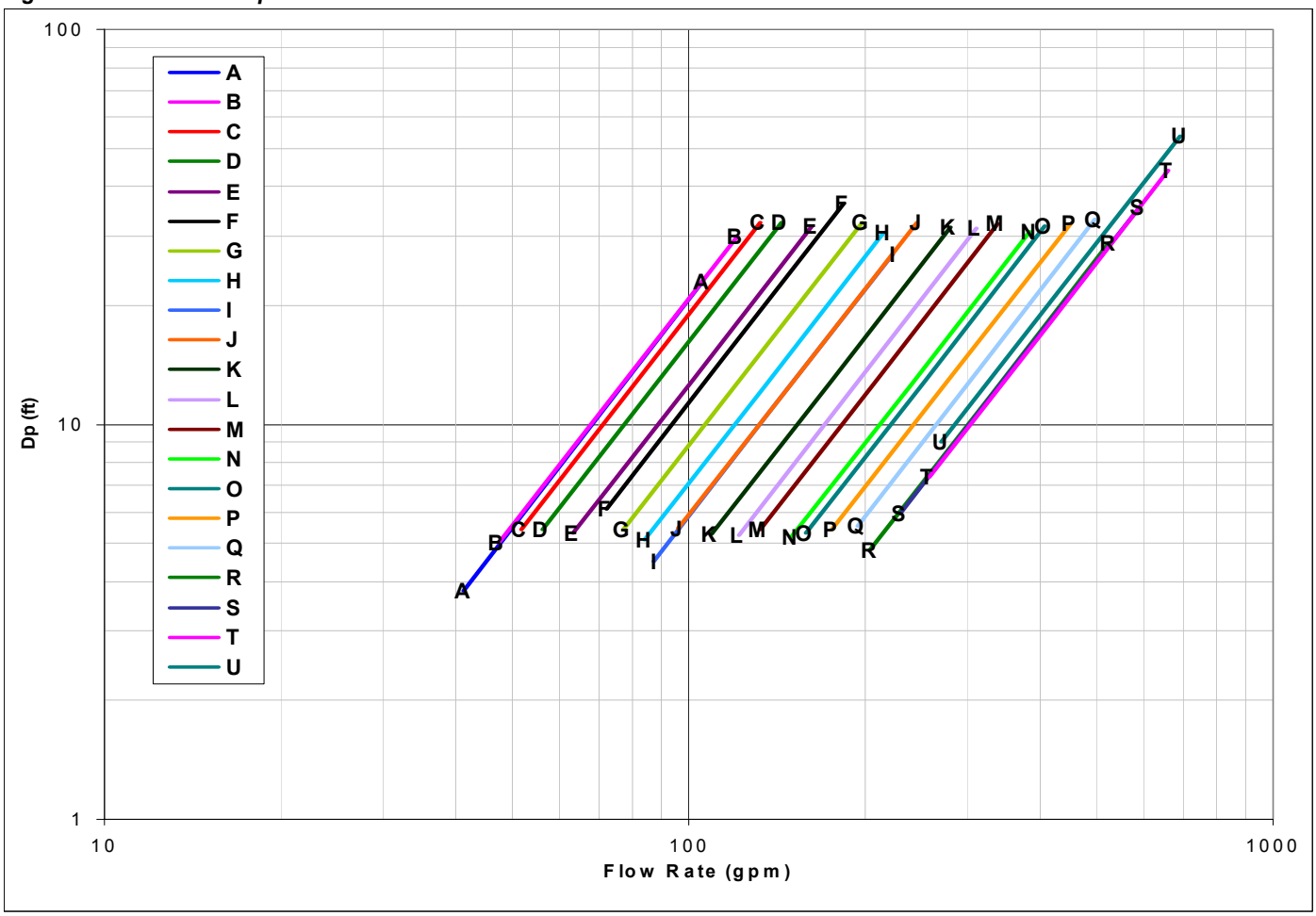


Table 20: Pressure Drop Data

Curve Ref.	Model	Evaporator Type	Minimum Flow Rate				Nominal Flow Rate				Maximum Flow Rate			
			IP		SI		IP		SI		IP		SI	
			gpm	DP ft.	lps	DP kpa	gpm	DP ft.	lps	DP kpa	gpm	DP ft.	lps	DP kpa
A	025D	Brazed Plate	41.3	3.8	2.6	11.5	66.0	9.4	4.2	28.1	105.6	23.0	6.7	68.6
B	030D		47.4	5.0	3.0	15.0	75.8	12.3	4.8	36.7	121.3	30.0	7.7	89.7
C	035D		51.8	5.4	3.3	16.3	82.8	13.3	5.2	39.7	132.5	32.5	8.4	97.0
D	040D		56.4	5.4	3.6	16.3	90.2	13.3	5.7	39.7	144.4	32.5	9.1	97.0
E	045D		63.5	5.3	4.0	15.9	101.5	13.0	6.4	38.8	162.4	31.8	10.2	94.8
F	050D		72.2	6.1	4.6	18.2	115.4	14.9	7.3	44.5	184.7	36.4	11.7	108.7
G	055D		77.4	5.4	4.9	16.3	123.8	13.3	7.8	39.7	198.1	32.5	12.5	97.0
H	060D		84.2	5.1	5.3	15.3	134.6	12.5	8.5	37.3	215.4	30.5	13.6	91.2
I	065D		87.2	4.5	5.5	13.4	139.4	11.0	8.8	32.8	223.1	26.9	14.1	80.2
J	070D		96.2	5.4	6.1	16.3	153.8	13.3	9.7	39.7	246.1	32.5	15.5	97.0
K	075D		109.7	5.3	6.9	15.8	175.4	12.9	11.1	38.5	280.7	31.5	17.7	94.1
L	080D		121.7	5.2	7.7	15.6	194.6	12.8	12.3	38.2	311.4	31.3	19.7	93.4
M	090D		132.3	5.4	8.3	16.1	211.7	13.2	13.4	39.4	338.7	32.2	21.4	96.3
N	100D		149.7	5.2	9.4	15.4	239.5	12.6	15.1	37.6	383.2	30.8	24.2	91.9
O	110D		159.2	5.3	10.0	15.9	254.6	13.0	16.1	38.8	407.4	31.8	25.7	94.8
P	125D		175.7	5.4	11.1	16.1	281.0	13.2	17.7	39.4	449.7	32.2	28.4	96.3
Q	130D		194.3	5.5	12.3	16.5	310.8	13.5	19.6	40.3	497.3	33.0	31.4	98.5
R	140D	Shell-and-Tube	204.3	4.8	12.9	14.4	326.9	11.8	20.6	35.2	523.0	28.8	33.0	86.1
S	160D		230.0	5.9	14.5	17.7	367.9	14.5	23.2	43.3	588.7	35.4	37.1	105.8
T	180D		258.3	7.4	16.3	22.0	413.3	18.0	26.1	53.7	661.2	44.0	41.7	131.3
U	190D		270.2	9.0	17.0	26.9	432.2	22.0	27.3	65.7	691.6	53.7	43.6	160.5

Electrical Data Notes

Notes for Unit Amp Draw:

1. Compressor RLA values are for wiring sizing purposes only. Normal operating current draw at rated capacity may be less than the RLA value.

Notes for Electrical Data Single- and Multi-Point

1. Unit wire size ampacity (MCA) is equal to 125% of the largest compressor-motor RLA plus 100% of RLA of all other loads in the circuit.
2. The control transformer is furnished and no separate 115V power is required. For both single- and multi-point power connections, the control transformer is in circuit #1 with control power wired from there to circuit #2. In multi-point power, disconnecting power to circuit #1 disconnects control power to the unit.
3. Wire sizing amps is 10 amps if a separate 115V power supply is used for the control circuit.
4. Recommended power lead wire sizes for 3 conductors per conduit are based on 100% conductor ampacity in accordance with NEC. Voltage drop has not been included. It is recommended that power leads be kept short. All terminal block connections must be made with copper (type THW) wire.
5. Recommended Fuse Sizes are selected at approximately 175% of the largest compressor RLA, plus 100% of all other loads in the circuit.
6. Maximum Fuse or breaker size is equal to 225% of the largest compressor RLA, plus 100% of all other loads in the circuit.
7. The recommended power lead wire sizes are based on an ambient temperature of 86°F (30°C). Ampacity correction factors must be applied for other ambient temperatures. Refer to the National Electrical Code Handbook.
8. Must be electrically grounded according to national and local electrical codes.

Notes for Wiring Data

1. Single-point power supply requires a single disconnect to supply electrical power to the unit. This power supply must either be fused or use a circuit breaker.
2. All field wiring to unit power block or optional non-fused disconnect switch must be copper.
3. All field wire size values given in table apply to 75°C rated wire per NEC.

Voltage Limitations:

1. Within 10 percent of nameplate rating.
2. Voltage unbalance not to exceed 2% with a resultant current unbalance of 6 to 10 times the voltage unbalance per NEMA MG-1, 2009 Standard Rev. 1-2010.

Circuit Breakers

Factory installed compressor circuit breakers for short circuit protection are standard on units with single point power supply only. This option provides unit installed compressor short circuit protection and makes servicing easier.

Table 21: HSSCR Panel Rating

AGZ-D Model Size	208V-230V	380V-460V	575V
025-190	100kA	65kA	25kA

Table 22: Standard Panel Rating

AGZ-D Model Size	208V	230V	380V	460V	575V
025-080, 125	5kA	5kA	5kA	5kA	5kA
090-110, 130-160	5kA	5kA	10kA	5kA	5kA
180,190	5kA	10kA	10kA	10kA	5kA

Electrical Control Center

Operating and equipment protection controls and motor starting components are separately housed in a centrally located, weather resistant control panel with hinged and tool-locked doors. In addition to the MicroTech III controller described in the next sections, the following components are housed in the panel:

- Power terminal blocks, multi-point connection standard
- Control, input, and output terminal block
- Control transformer
- Optional disconnect switch (through-the-door handle)
- Compressor motor inherent thermal and overload protection is standard
- Optional phase voltage monitor with under/over voltage and phase reversal protection
- Fan contactors with short circuit protective devices.
- Optional ground fault protection
- FanTrol fan staging head pressure control system
- Power connections are per the following table

Power Connections

Table 23: Power Connection Availability

Power Connection	Power Block	Disc. Swt.	Comp Circuit Breakers	Panel High Short Circuit Current Rating
AGZ025D-190D Optional Single Point	Std	Opt.	Std	Opt
AGZ025D-190D Standard Multi-Point	Std	Opt.	Not Avail.	Opt.

Definitions:

1. Power Block: An electrical device to directly accept field wiring without any disconnecting means.
2. Disconnect Switch: A molded case switch that accepts field wiring and disconnects main power to the entire unit or each main power supply if the multi-point power supply option is selected. This option does not provide overcurrent protection.
3. Compressor Circuit Breakers: A manually reset circuit breaker for each compressor, providing compressor only short circuit protection and located ahead of the contactor.
4. Control Panel High Short Circuit Current Rating: (Previously known as "withstand rating"). The entire control panel is designed for short circuit current rating as shown above. In the event of a short circuit, the damage is contained within the control panel enclosure.

Field Wiring Diagram

Figure 29: Typical Field Wiring Diagram *(Single-point connection)*

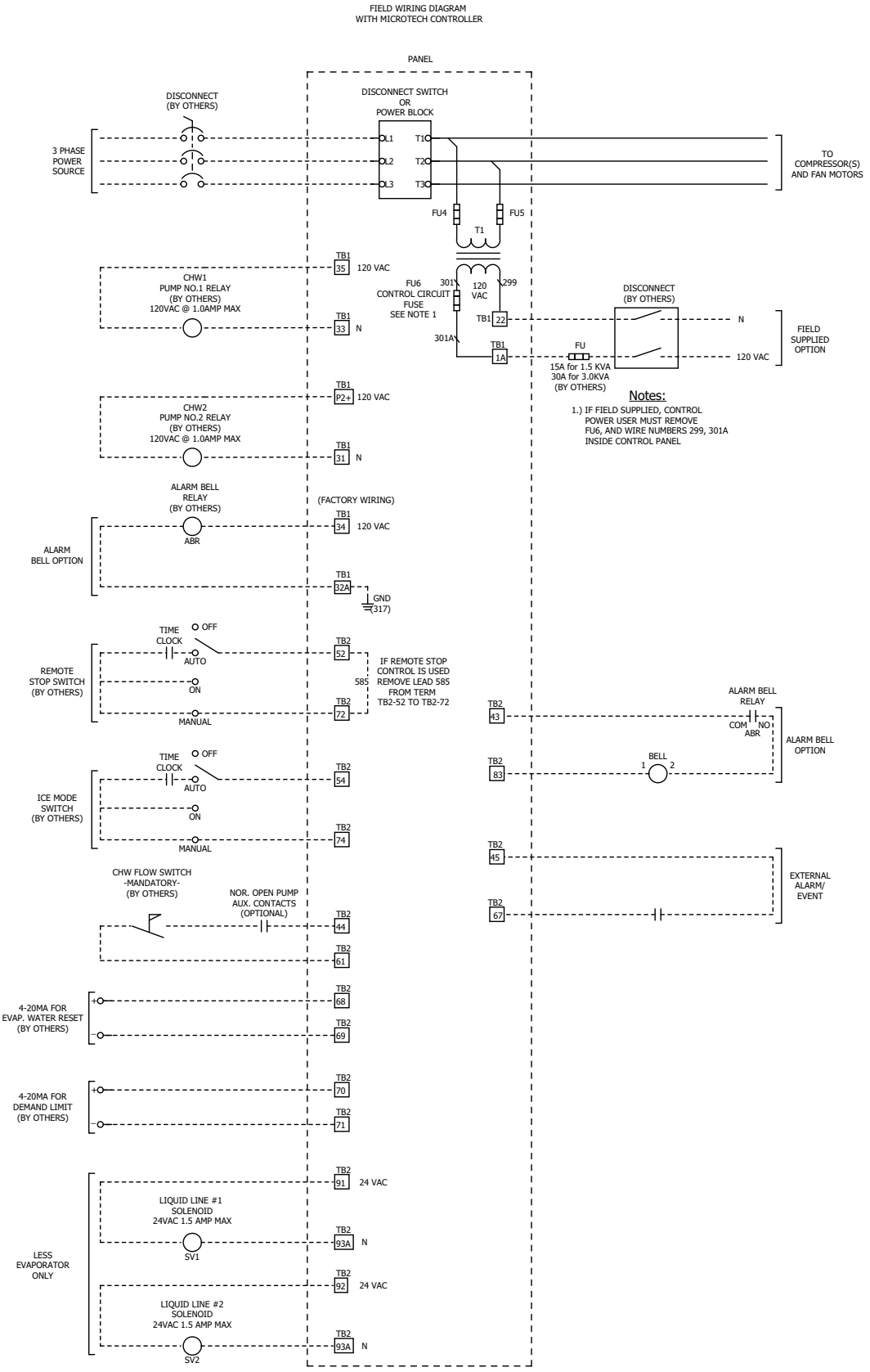
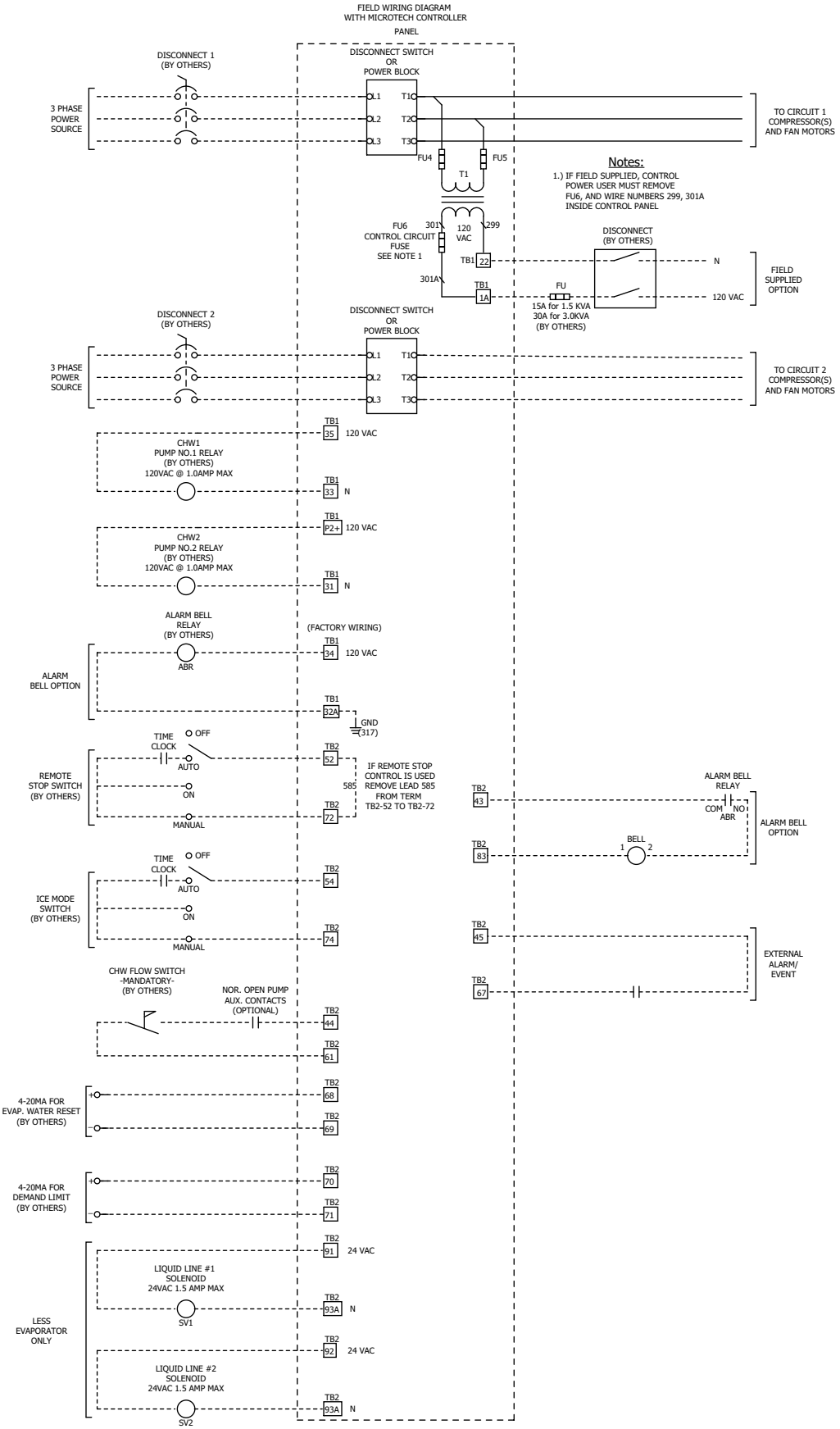


Figure 30: Typical Field Wiring Diagram *(Multi-point connection)*



Electrical Data

Table 24: Unit Amp Draw, 50 & 60 Hz

AGZ-D Size	Volts/ Phase	Rated Load Amps						Locked Rotor Amps						Fan Motors		
		Circuit #1			Circuit #2			Circuit #1			Circuit #2					
		#1	#3	#5	#2	#4	#6	#1	#3	#5	#2	#4	#6	Qty	FLA (ea)	LRA (ea)
025D	208V/60	29.5	29.5		29.5	29.5		195	195		195	195		4	5.8	23.3
	230V/60	29.5	29.5		29.5	29.5		195	195		195	195		4	5.8	23.3
	380V/60	15.4	15.4		15.4	15.4		123	123		123	123		4	4.1	20.0
	460V/60	12.8	12.8		12.8	12.8		100	100		100	100		4	2.8	13.0
	400V/50	12.8	12.8		12.8	12.8		100	100		100	100		4	2.8	13.0
	575V/60	12.2	12.2		12.2	12.2		80	80		80	80		4	3.0	14.0
030D	208V/60	31.6	31.6		31.6	31.6		225	225		225	225		4	5.8	23.3
	230V/60	30.1	30.1		30.1	30.1		225	225		225	225		4	5.8	23.3
	380V/60	19.2	19.2		19.2	19.2		140	140		140	140		4	4.1	20.0
	460V/60	16.7	16.7		16.7	16.7		114	114		114	114		4	2.8	13.0
	400V/50	16.7	16.7		16.7	16.7		114	114		114	114		4	2.8	13.0
	575V/60	13	13		13	13		80	80		80	80		4	3.0	14.0
035D	208V/60	31.6	31.6		36.3	36.3		225	225		239	239		4	5.8	23.3
	230V/60	30.1	30.1		36	36		225	225		239	239		4	5.8	23.3
	380V/60	19.2	19.2		23.7	23.7		140	140		145	145		4	4.1	20.0
	460V/60	16.7	16.7		17.9	17.9		114	114		125	125		4	2.8	13.0
	400V/50	16.7	16.7		17.9	17.9		114	114		125	125		4	2.8	13.0
	575V/60	13	13		13	13		80	80		80	80		4	3.0	14.0
040D	208V/60	36.3	36.3		36.3	36.3		239	239		239	239		4	5.8	23.3
	230V/60	36	36		36	36		239	239		239	239		4	5.8	23.3
	380V/60	23.7	23.7		23.7	23.7		145	145		145	145		4	4.1	20.0
	460V/60	17.9	17.9		17.9	17.9		125	125		125	125		4	2.8	13.0
	400V/50	17.9	17.9		17.9	17.9		125	125		125	125		4	2.8	13.0
	575V/60	13	13		13	13		80	80		80	80		4	3.0	14.0
045D	208V/60	48.1	48.1		48.1	48.1		245	245		245	245		4	5.8	23.3
	230V/60	48.1	48.1		48.1	48.1		245	245		245	245		4	5.8	23.3
	380V/60	23.7	23.7		23.7	23.7		145	145		145	145		4	4.1	20.0
	460V/60	18.9	18.9		18.9	18.9		125	125		125	125		4	2.8	13.0
	400V/50	18.9	18.9		18.9	18.9		125	125		125	125		4	2.8	13.0
	575V/60	15.1	15.1		15.1	15.1		100	100		100	100		4	3.0	14.0
050D	208V/60	52.8	52.8		52.8	52.8		300	300		300	300		4	5.8	23.3
	230V/60	52.8	52.8		52.8	52.8		300	300		300	300		4	5.8	23.3
	380V/60	26.9	26.9		26.9	26.9		139	139		139	139		4	4.1	20.0
	460V/60	23.1	23.1		23.1	23.1		150	150		150	150		4	2.8	13.0
	400V/50	23.1	23.1		23.1	23.1		150	150		150	150		4	2.8	13.0
	575V/60	19.9	19.9		19.9	19.9		109	109		109	109		4	3.0	14.0
055D	208V/60	52.8	52.8		56.6	56.6		300	300		340	340		4	5.8	23.3
	230V/60	52.8	52.8		55.8	55.8		300	300		340	340		4	5.8	23.3
	380V/60	26.9	26.9		34	34		139	139		196	196		4	4.1	20.0
	460V/60	23.1	23.1		26.9	26.9		150	150		172	172		4	2.8	13.0
	400V/50	23.1	23.1		26.9	26.9		150	150		172	172		4	2.8	13.0
	575V/60	19.9	19.9		23.7	23.7		109	109		132	132		4	3.0	14.0

Table 25: Unit Amp Draw, 50 & 60 Hz continued

AGZ-D Size	Volts/ Phase	Rated Load Amps						Locked Rotor Amps						Fan Motors		
		Circuit #1			Circuit #2			Circuit #1			Circuit #2					
		#1	#3	#5	#2	#4	#6	#1	#3	#5	#2	#4	#6	Qty	FLA (ea)	LRA (ea)
060D	208V/60	56.6	56.6		56.6	56.6		340	340		340	340		4	5.8	23.3
	230V/60	55.8	55.8		55.8	55.8		340	340		340	340		4	5.8	23.3
	380V/60	34	34		34	34		196	196		196	196		4	4.1	20.0
	460V/60	26.9	26.9		26.9	26.9		172	172		172	172		4	2.8	13.0
	400V/50	26.9	26.9		26.9	26.9		172	172		172	172		4	2.8	13.0
	575V/60	23.7	23.7		23.7	23.7		132	132		132	132		4	3.0	14.0
065D	208V/60	56.6	56.6		56.6	56.6		340	340		340	340		4	7.8	31.7
	230V/60	55.8	55.8		55.8	55.8		340	340		340	340		4	7.8	35.6
	380V/60	34	34		34	34		196	196		196	196		4	4.1	20.0
	460V/60	26.9	26.9		26.9	26.9		172	172		172	172		4	3.6	17.8
	400V/50	26.9	26.9		26.9	26.9		172	172		172	172		4	3.6	17.8
	575V/60	23.7	23.7		23.7	23.7		132	132		132	132		4	3.0	14.0
070D	208V/60	56.6	74.5		56.6	74.5		340	505		340	505		4	7.8	31.7
	230V/60	55.8	74.5		55.8	74.5		340	505		340	505		4	7.8	35.6
	380V/60	34	38.2		34	38.2		196	290		196	290		4	4.1	20.0
	460V/60	26.9	33		26.9	33		172	225		172	225		4	3.6	17.8
	400V/50	26.9	33		26.9	33		172	225		172	225		4	3.6	17.8
	575V/60	23.7	25.2		23.7	25.2		132	180		132	180		4	3.0	14.0
075D	208V/60	74.5	74.5		74.5	74.5		505	505		505	505		6	7.8	31.7
	230V/60	74.5	74.5		74.5	74.5		505	505		505	505		6	7.8	35.6
	380V/60	38.2	38.2		38.2	38.2		290	290		290	290		6	4.1	20.0
	460V/60	33	33		33	33		225	225		225	225		6	3.6	17.8
	400V/50	33	33		33	33		225	225		225	225		6	3.6	17.8
	575V/60	25.2	25.2		25.2	25.2		180	180		180	180		6	3.0	14.0
080D	208V/60	74.5	74.5		89.1	89.1		505	505		544	544		6	7.8	31.7
	230V/60	74.5	74.5		89.1	89.1		505	505		544	544		6	7.8	35.6
	380V/60	38.2	38.2		51.9	51.9		290	290		353	353		6	4.1	20.0
	460V/60	33	33		44.5	44.5		225	225		272	272		6	3.6	17.8
	400V/50	33	33		44.5	44.5		225	225		272	272		6	3.6	17.8
	575V/60	25.2	25.2		32.1	32.1		180	180		218	218		6	3.0	14.0
090D	208V/60	89.1	89.1		89.1	89.1		544	544		544	544		6	7.8	31.7
	230V/60	89.1	89.1		89.1	89.1		544	544		544	544		6	7.8	35.6
	380V/60	51.9	51.9		51.9	51.9		353	353		353	353		6	4.1	20.0
	460V/60	44.5	44.5		44.5	44.5		272	272		272	272		6	3.6	17.8
	400V/50	44.5	44.5		44.5	44.5		272	272		272	272		6	3.6	17.8
	575V/60	32.1	32.1		32.1	32.1		218	218		218	218		6	3.0	14.0
100D	208V/60	89.1	116		89.1	116		544	599		544	599		6	7.8	31.7
	230V/60	89.1	116		89.1	116		544	599		544	599		6	7.8	35.6
	380V/60	51.9	69.2		51.9	69.2		353	358		353	358		6	4.1	20.0
	460V/60	43	54.5		43	54.5		272	310		272	310		6	3.6	17.8
	400V/50	43	54.5		43	54.5		272	310		272	310		6	3.6	17.8
	575V/60	32.1	44.5		32.1	44.5		218	239		218	239		6	3.0	14.0

Electrical Data

Table 26: Unit Amp Draw, 50 & 60 Hz continued

AGZ-D Size	Volts/ Phase	Rated Load Amps						Locked Rotor Amps						Fan Motors		
		Circuit #1			Circuit #2			Circuit #1			Circuit #2					
		#1	#3	#5	#2	#4	#6	#1	#3	#5	#2	#4	#6	Qty	FLA (ea)	LRA (ea)
110D	208V/60	74.5	74.5	74.5	74.5	74.5	74.5	505	505	505	505	505	505	8	7.8	31.7
	230V/60	74.5	74.5	74.5	74.5	74.5	74.5	505	505	505	505	505	505	8	7.8	35.6
	380V/60	38.2	38.2	38.2	38.2	38.2	38.2	290	290	290	290	290	290	8	4.1	20.0
	460V/60	30.6	30.6	30.6	30.6	30.6	30.6	225	225	225	225	225	225	8	3.6	17.8
	400V/50	30.6	30.6	30.6	30.6	30.6	30.6	225	225	225	225	225	225	8	3.6	17.8
	575V/60	25.2	25.2	25.2	25.2	25.2	25.2	180	180	180	180	180	180	8	3.0	14.0
125D	208V/60	86.3	86.3	86.3	89.1	89.1	89.1	505	505	505	544	544	544	8	7.8	31.7
	230V/60	86.3	86.3	86.3	89.1	89.1	89.1	505	505	505	544	544	544	8	7.8	35.6
	380V/60	38.2	38.2	38.2	51.9	51.9	51.9	290	290	290	353	353	353	8	4.1	20.0
	460V/60	30.6	30.6	30.6	44.5	44.5	44.5	225	225	225	272	272	272	8	3.6	17.8
	400V/50	30.6	30.6	30.6	44.5	44.5	44.5	225	225	225	272	272	272	8	3.6	17.8
	575V/60	25.2	25.2	25.2	32.1	32.1	32.1	180	180	180	218	218	218	8	3.0	14.0
130D	208V/60	89.1	89.1	89.1	89.1	89.1	89.1	544	544	544	544	544	544	8	7.8	31.7
	230V/60	89.1	89.1	89.1	89.1	89.1	89.1	544	544	544	544	544	544	8	7.8	35.6
	380V/60	51.9	51.9	51.9	51.9	51.9	51.9	353	353	353	353	353	353	8	4.1	20.0
	460V/60	44.5	44.5	44.5	44.5	44.5	44.5	272	272	272	272	272	272	8	3.6	17.8
	400V/50	44.5	44.5	44.5	44.5	44.5	44.5	272	272	272	272	272	272	8	3.6	17.8
	575V/60	32.1	32.1	32.1	32.1	32.1	32.1	218	218	218	218	218	218	8	3.0	14.0
140D	208V/60	89.1	89.1	89.1	89.1	89.1	89.1	544	544	544	544	544	544	10	7.8	31.7
	230V/60	89.1	89.1	89.1	89.1	89.1	89.1	544	544	544	544	544	544	10	7.8	35.6
	380V/60	51.9	51.9	51.9	51.9	51.9	51.9	353	353	353	353	353	353	10	4.1	20.0
	460V/60	44.5	44.5	44.5	44.5	44.5	44.5	272	272	272	272	272	272	10	3.6	17.8
	400V/50	44.5	44.5	44.5	44.5	44.5	44.5	272	272	272	272	272	272	10	3.6	17.8
	575V/60	32.1	32.1	32.1	32.1	32.1	32.1	218	218	218	218	218	218	10	3.0	14.0
160D	208V/60	89.1	89.1	89.1	116	116	116	544	544	544	599	599	599	10	7.8	31.7
	230V/60	89.1	89.1	89.1	116	116	116	544	544	544	599	599	599	10	7.8	35.6
	380V/60	51.9	51.9	51.9	69.2	69.2	69.2	353	353	353	358	358	358	10	4.1	20.0
	460V/60	44.5	44.5	44.5	54.5	54.5	54.5	272	272	272	310	310	310	10	3.6	17.8
	400V/50	44.5	44.5	44.5	54.5	54.5	54.5	272	272	272	310	310	310	10	3.6	17.8
	575V/60	32.1	32.1	32.1	44.5	44.5	44.5	218	218	218	239	239	239	10	3.0	14.0
180D	208V/60	128	128	128	128	128	128	599	599	599	599	599	599	10	7.8	31.7
	230V/60	116	116	116	116	116	116	599	599	599	599	599	599	10	7.8	35.6
	380V/60	69.2	69.2	69.2	69.2	69.2	69.2	358	358	358	358	358	358	10	4.1	20.0
	460V/60	57.2	57.2	57.2	57.2	57.2	57.2	310	310	310	310	310	310	10	3.6	17.8
	400V/50	57.2	57.2	57.2	57.2	57.2	57.2	310	310	310	310	310	310	10	3.6	17.8
	575V/60	44.5	44.5	44.5	44.5	44.5	44.5	239	239	239	239	239	239	10	3.0	14.0
190D	208V/60	128	128	128	128	128	128	599	599	599	599	599	599	12	7.8	31.7
	230V/60	116	116	116	116	116	116	599	599	599	599	599	599	12	7.8	35.6
	380V/60	69.2	69.2	69.2	69.2	69.2	69.2	358	358	358	358	358	358	12	4.1	20.0
	460V/60	57.2	57.2	57.2	57.2	57.2	57.2	310	310	310	310	310	310	12	3.6	17.8
	400V/50	57.2	57.2	57.2	57.2	57.2	57.2	310	310	310	310	310	310	12	3.6	17.8
	575V/60	44.5	44.5	44.5	44.5	44.5	44.5	239	239	239	239	239	239	12	3.0	14.0

Table 27: Electrical Data - Single Point (50/60 Hz)

Model	Volts/Phase	MCA	Power Supply				Fuse / Circuit Breaker Size	
			Field Wire		Field Hub.			
			Qty	Wire GA	Qty	Size (in.)	Recom.	Max.
025D	208V/60	149	3	1/0 AWG	1	1.5	175	175
	230V/60	149	3	1/0 AWG	1	1.5	175	175
	380V/60	82	3	4 AWG	1	1	90	90
	460V/60	66	3	4 AWG	1	1	70	70
	400V/50	66	3	4 AWG	1	1	70	70
	575V/60	64	3	6 AWG	1	0.75	70	70
030D	208V/60	158	3	2/0 AWG	1	1.5	175	175
	230V/60	152	3	2/0 AWG	1	1.5	175	175
	380V/60	98	3	3 AWG	1	1	110	110
	460V/60	83	3	4 AWG	1	1	90	90
	400V/50	83	3	4 AWG	1	1	90	90
	575V/60	68	3	4 AWG	1	1	80	80
035D	208V/60	169	3	2/0 AWG	1	1.5	200	200
	230V/60	165	3	2/0 AWG	1	1.5	200	200
	380V/60	109	3	2 AWG	1	1.25	125	125
	460V/60	85	3	4 AWG	1	1	100	100
	400V/50	85	3	4 AWG	1	1	100	100
	575V/60	68	3	4 AWG	1	1	80	80
040D	208V/60	178	3	3/0 AWG	1	2	200	200
	230V/60	177	3	3/0 AWG	1	2	200	200
	380V/60	118	3	1 AWG	1	1.25	125	125
	460V/60	88	3	3 AWG	1	1	100	100
	400V/50	88	3	3 AWG	1	1	100	100
	575V/60	68	3	4 AWG	1	1	80	80
045D	208V/60	228	3	4/0 AWG	1	2	250	250
	230V/60	228	3	4/0 AWG	1	2	250	250
	380V/60	118	3	1 AWG	1	1.25	125	125
	460V/60	92	3	3 AWG	1	1	110	110
	400V/50	92	3	3 AWG	1	1	110	110
	575V/60	77	3	4 AWG	1	1	90	90
050D	208V/60	248	3	250 MCM	1	2	300	300
	230V/60	248	3	250 MCM	1	2	300	300
	380V/60	131	3	1/0 AWG	1	1.5	150	150
	460V/60	110	3	2 AWG	1	1.25	125	125
	400V/50	110	3	2 AWG	1	1.25	125	125
	575V/60	97	3	3 AWG	1	1	110	110
055D	208V/60	257	3	300 MCM	1	2.5	300	300
	230V/60	255	3	250 MCM	1	2	300	300
	380V/60	147	3	1/0 AWG	1	1.5	175	175
	460V/60	118	3	1 AWG	1	1.25	125	125
	400V/50	118	3	1 AWG	1	1.25	125	125
	575V/60	106	3	2 AWG	1	1.25	125	125

Electrical Data

Table 28: Electrical Data - Single Point (50/60 Hz) continued

Model	Volts/Phase	MCA	Power Supply				Fuse / Circuit Breaker Size	
			Field Wire		Field Hub.			
			Qty	Wire GA	Qty	Size (in.)	Recom.	Max.
060D	208V/60	264	3	300 MCM	1	2.5	300	300
	230V/60	261	3	300 MCM	1	2.5	300	300
	380V/60	161	3	2/0 AWG	1	1.5	175	175
	460V/60	126	3	1 AWG	1	1.25	150	150
	400V/50	126	3	1 AWG	1	1.25	150	150
	575V/60	113	3	2 AWG	1	1.25	125	125
065D	208V/60	272	3	300 MCM	1	2.5	300	300
	230V/60	269	3	300 MCM	1	2.5	300	300
	380V/60	161	3	2/0 AWG	1	1.5	175	175
	460V/60	129	3	1 AWG	1	1.25	150	150
	400V/50	129	3	1 AWG	1	1.25	150	150
	575V/60	113	3	2 AWG	1	1.25	125	125
070D	208V/60	312	3	400 MCM	1	2.5	350	350
	230V/60	311	3	400 MCM	1	2.5	350	350
	380V/60	171	3	2/0 AWG	1	1.5	200	200
	460V/60	143	3	1/0 AWG	1	1.5	175	175
	400V/50	143	3	1/0 AWG	1	1.5	175	175
	575V/60	117	3	1 AWG	1	1.25	125	125
075D	208V/60	364	6	4/0 AWG	1	3	400	400
	230V/60	364	6	4/0 AWG	1	3	400	400
	380V/60	187	3	3/0 AWG	1	2	225	225
	460V/60	162	3	2/0 AWG	1	1.5	175	175
	400V/50	162	3	2/0 AWG	1	1.5	175	175
	575V/60	126	3	1 AWG	1	1.25	150	150
080D	208V/60	397	6	250 MCM	1	3	450	450
	230V/60	397	6	250 MCM	1	3	450	450
	380V/60	218	3	4/0 AWG	1	2	250	250
	460V/60	188	3	3/0 AWG	1	2	225	225
	400V/50	188	3	3/0 AWG	1	2	225	225
	575V/60	141	3	1/0 AWG	1	1.5	150	150
090D	208V/60	426	6	4/0 AWG	2	2	500	500
	230V/60	426	6	4/0 AWG	2	2	500	500
	380V/60	246	3	250 MCM	1	2	250	250
	460V/60	211	3	4/0 AWG	1	2	250	250
	400V/50	211	3	4/0 AWG	1	2	250	250
	575V/60	155	3	2/0 AWG	1	1.5	175	175
100D	208V/60	485	6	250 MCM	2	2	600	600
	230V/60	485	6	250 MCM	2	2	600	600
	380V/60	285	3	300 MCM	1	2.5	350	350
	460V/60	230	3	4/0 AWG	1	2	250	250
	400V/50	230	3	4/0 AWG	1	2	250	250
	575V/60	183	3	3/0 AWG	1	2	225	225

Table 29: Electrical Data - Single Point (50/60 Hz) continued

Model	Volts/Phase	MCA	Power Supply				Fuse / Circuit Breaker Size	
			Field Wire		Field Hub.			
			Qty	Wire GA	Qty	Size (in.)	Recom.	Max.
110D	208V/60	528	6	300 MCM	2	2.5	600	600
	230V/60	528	6	300 MCM	2	2.5	600	600
	380V/60	272	3	300 MCM	1	2.5	300	300
	460V/60	221	3	4/0 AWG	1	2	250	250
	400V/50	221	3	4/0 AWG	1	2	250	250
	575V/60	182	3	3/0 AWG	1	2	200	200
125D	208V/60	611	6	350 MCM	2	2.5	700	700
	230V/60	611	6	350 MCM	2	2.5	700	700
	380V/60	317	3	400 MCM	1	2.5	350	350
	460V/60	266	3	300 MCM	1	2.5	300	300
	400V/50	266	3	300 MCM	1	2.5	300	300
	575V/60	204	3	4/0 AWG	1	2	225	225
130D	208V/60	620	6	350 MCM	2	2.5	700	700
	230V/60	620	6	350 MCM	2	2.5	700	700
	380V/60	358	6	4/0 AWG	1	3	400	400
	460V/60	307	3	350 MCM	1	2.5	350	350
	400V/50	307	3	350 MCM	1	2.5	350	350
	575V/60	225	3	4/0 AWG	1	2	250	250
140D	208V/60	635	6	400 MCM	2	2.5	700	700
	230V/60	635	6	400 MCM	2	2.5	700	700
	380V/60	366	6	4/0 AWG	1	3	400	400
	460V/60	315	3	400 MCM	1	2.5	350	350
	400V/50	315	3	400 MCM	1	2.5	350	350
	575V/60	231	3	250 MCM	1	2	250	250
160D	208V/60	721	12	4/0 AWG	2	3	800	800
	230V/60	721	12	4/0 AWG	2	3	800	800
	380V/60	422	6	4/0 AWG	2	2	450	450
	460V/60	347	6	4/0 AWG	1	3	400	400
	400V/50	347	6	4/0 AWG	1	3	400	400
	575V/60	271	3	300 MCM	1	2.5	300	300
180D	208V/60	875	12	300 MCM	2	3.5	1000	1000
	230V/60	800	12	250 MCM	2	3	800	800
	380V/60	474	6	250 MCM	2	2	500	500
	460V/60	394	6	250 MCM	1	3	450	450
	400V/50	394	6	250 MCM	1	3	450	450
	575V/60	309	3	350 MCM	1	2.5	350	350
190D	208V/60	891	12	300 MCM	2	3.5	1000	1000
	230V/60	816	12	250 MCM	2	3	800	800
	380V/60	482	6	250 MCM	2	2	500	500
	460V/60	401	6	250 MCM	1	3	450	450
	400V/50	401	6	250 MCM	1	3	450	450
	575V/60	315	3	400 MCM	1	2.5	350	350

Electrical Data

Table 30: Electrical Data - Mutli-point (50/60 Hz)

AGZ	Volts/ Phase	Circuit #1							Circuit #2						
		MCA	Field Wire		Field Hub.		Fuse Size		MCA	Field Wire		Field Hub.		Fuse Size	
			Qty	Wire GA	Qty	Size	Rec.	Max.		Qty	Wire GA	Qty	Size	Rec.	Max.
025D	208V/60	78	3	4 AWG	1	1	100	100	78	3	4 AWG	1	1	100	100
	230V/60	78	3	4 AWG	1	1	100	100	78	3	4 AWG	1	1	100	100
	380V/60	43	3	8 AWG	1	0.5	50	50	43	3	8 AWG	1	0.5	50	50
	460V/60	35	3	10 AWG	1	0.5	45	45	35	3	10 AWG	1	0.5	45	45
	400V/50	35	3	10 AWG	1	0.5	45	45	35	3	10 AWG	1	0.5	45	45
	575V/60	34	3	10 AWG	1	0.5	45	45	34	3	10 AWG	1	0.5	45	45
030D	208V/60	83	3	4 AWG	1	1	110	110	83	3	4 AWG	1	1	110	110
	230V/60	80	3	4 AWG	1	1	100	100	80	3	4 AWG	1	1	100	100
	380V/60	52	3	6 AWG	1	0.75	70	70	52	3	6 AWG	1	0.75	70	70
	460V/60	44	3	8 AWG	1	0.5	60	60	44	3	8 AWG	1	0.5	60	60
	400V/50	44	3	8 AWG	1	0.5	60	60	44	3	8 AWG	1	0.5	60	60
	575V/60	36	3	8 AWG	1	0.5	45	45	36	3	8 AWG	1	0.5	45	45
035D	208V/60	83	3	4 AWG	1	1	110	110	94	3	3 AWG	1	1	125	125
	230V/60	80	3	4 AWG	1	1	100	100	93	3	3 AWG	1	1	125	125
	380V/60	52	3	6 AWG	1	0.75	70	70	62	3	6 AWG	1	0.75	80	80
	460V/60	44	3	8 AWG	1	0.5	60	60	46	3	8 AWG	1	0.5	60	60
	400V/50	44	3	8 AWG	1	0.5	60	60	46	3	8 AWG	1	0.5	60	60
	575V/60	36	3	8 AWG	1	0.5	45	45	36	3	8 AWG	1	0.5	45	45
040D	208V/60	94	3	3 AWG	1	1	125	125	94	3	3 AWG	1	1	125	125
	230V/60	93	3	3 AWG	1	1	125	125	93	3	3 AWG	1	1	125	125
	380V/60	62	3	6 AWG	1	0.75	80	80	62	3	6 AWG	1	0.75	80	80
	460V/60	46	3	8 AWG	1	0.5	60	60	46	3	8 AWG	1	0.5	60	60
	400V/50	46	3	8 AWG	1	0.5	60	60	46	3	8 AWG	1	0.5	60	60
	575V/60	36	3	8 AWG	1	0.5	45	45	36	3	8 AWG	1	0.5	45	45
045D	208V/60	120	3	1 AWG	1	1.25	150	150	120	3	1 AWG	1	1.25	150	150
	230V/60	120	3	1 AWG	1	1.25	150	150	120	3	1 AWG	1	1.25	150	150
	380V/60	62	3	6 AWG	1	0.75	80	80	62	3	6 AWG	1	0.75	80	80
	460V/60	49	3	8 AWG	1	0.5	60	60	49	3	8 AWG	1	0.5	60	60
	400V/50	49	3	8 AWG	1	0.5	60	60	49	3	8 AWG	1	0.5	60	60
	575V/60	40	3	8 AWG	1	0.5	50	50	40	3	8 AWG	1	0.5	50	50
050D	208V/60	131	3	1/0 AWG	1	1.5	175	175	131	3	1/0 AWG	1	1.5	175	175
	230V/60	131	3	1/0 AWG	1	1.5	175	175	131	3	1/0 AWG	1	1.5	175	175
	380V/60	69	3	4 AWG	1	1	90	90	69	3	4 AWG	1	1	90	90
	460V/60	58	3	6 AWG	1	0.75	80	80	58	3	6 AWG	1	0.75	80	80
	400V/50	58	3	6 AWG	1	0.75	80	80	58	3	6 AWG	1	0.75	80	80
	575V/60	51	3	6 AWG	1	0.75	70	70	51	3	6 AWG	1	0.75	70	70
055D	208V/60	131	3	1/0 AWG	1	1.5	175	175	139	3	1/0 AWG	1	1.5	175	175
	230V/60	131	3	1/0 AWG	1	1.5	175	175	138	3	1/0 AWG	1	1.5	175	175
	380V/60	69	3	4 AWG	1	1	90	90	85	3	4 AWG	1	1	110	110
	460V/60	58	3	6 AWG	1	0.75	80	80	67	3	4 AWG	1	1	90	90
	400V/50	58	3	6 AWG	1	0.75	80	80	67	3	4 AWG	1	1	90	90
	575V/60	51	3	6 AWG	1	0.75	70	70	60	3	6 AWG	1	0.75	80	80

Table 31: Electrical Data - Mutli-point (50/60 Hz) continued

AGZ	Volts/ Phase	Circuit #1							Circuit #2						
		MCA	Field Wire		Field Hub.		Fuse Size		MCA	Field Wire		Field Hub.		Fuse Size	
			Qty	Wire GA	Qty	Size	Rec.	Max.		Qty	Wire GA	Qty	Size	Rec.	Max.
060D	208V/60	139	3	1/0 AWG	1	1.5	175	175	139	3	1/0 AWG	1	1.5	175	175
	230V/60	138	3	1/0 AWG	1	1.5	175	175	138	3	1/0 AWG	1	1.5	175	175
	380V/60	85	3	4 AWG	1	1	110	110	85	3	4 AWG	1	1	110	110
	460V/60	67	3	4 AWG	1	1	90	90	67	3	4 AWG	1	1	90	90
	400V/50	67	3	4 AWG	1	1	90	90	67	3	4 AWG	1	1	90	90
	575V/60	60	3	6 AWG	1	0.75	80	80	60	3	6 AWG	1	0.75	80	80
065D	208V/60	143	3	1/0 AWG	1	1.5	175	175	143	3	1/0 AWG	1	1.5	175	175
	230V/60	142	3	1/0 AWG	1	1.5	175	175	142	3	1/0 AWG	1	1.5	175	175
	380V/60	85	3	4 AWG	1	1	110	110	85	3	4 AWG	1	1	110	110
	460V/60	68	3	4 AWG	1	1	90	90	68	3	4 AWG	1	1	90	90
	400V/50	68	3	4 AWG	1	1	90	90	68	3	4 AWG	1	1	90	90
	575V/60	60	3	6 AWG	1	0.75	80	80	60	3	6 AWG	1	0.75	80	80
070D	208V/60	166	3	2/0 AWG	1	1.5	225	225	166	3	2/0 AWG	1	1.5	225	225
	230V/60	165	3	2/0 AWG	1	1.5	225	225	165	3	2/0 AWG	1	1.5	225	225
	380V/60	90	3	3 AWG	1	1	125	125	90	3	3 AWG	1	1	125	125
	460V/60	76	3	4 AWG	1	1	100	100	76	3	4 AWG	1	1	100	100
	400V/50	76	3	4 AWG	1	1	100	100	76	3	4 AWG	1	1	100	100
	575V/60	62	3	6 AWG	1	0.75	80	80	62	3	6 AWG	1	0.75	80	80
075D	208V/60	191	3	3/0 AWG	1	2	250	250	191	3	3/0 AWG	1	2	250	250
	230V/60	191	3	3/0 AWG	1	2	250	250	191	3	3/0 AWG	1	2	250	250
	380V/60	99	3	3 AWG	1	1	125	125	99	3	3 AWG	1	1	125	125
	460V/60	86	3	3 AWG	1	1	110	110	86	3	3 AWG	1	1	110	110
	400V/50	86	3	3 AWG	1	1	110	110	86	3	3 AWG	1	1	110	110
	575V/60	66	3	4 AWG	1	1	90	90	66	3	4 AWG	1	1	90	90
080D	208V/60	191	3	3/0 AWG	1	2	250	250	224	3	4/0 AWG	1	2	300	300
	230V/60	191	3	3/0 AWG	1	2	250	250	224	3	4/0 AWG	1	2	300	300
	380V/60	99	3	3 AWG	1	1	125	125	130	3	1 AWG	1	1.25	175	175
	460V/60	86	3	3 AWG	1	1	110	110	111	3	2 AWG	1	1.25	150	150
	400V/50	86	3	3 AWG	1	1	110	110	111	3	2 AWG	1	1.25	150	150
	575V/60	66	3	4 AWG	1	1	90	90	82	3	4 AWG	1	1	110	110
090D	208V/60	224	3	4/0 AWG	1	2	300	300	224	3	4/0 AWG	1	2	300	300
	230V/60	224	3	4/0 AWG	1	2	300	300	224	3	4/0 AWG	1	2	300	300
	380V/60	130	3	1 AWG	1	1.25	175	175	130	3	1 AWG	1	1.25	175	175
	460V/60	111	3	2 AWG	1	1.25	150	150	111	3	2 AWG	1	1.25	150	150
	400V/50	111	3	2 AWG	1	1.25	150	150	111	3	2 AWG	1	1.25	150	150
	575V/60	82	3	4 AWG	1	1	110	110	82	3	4 AWG	1	1	110	110
100D	208V/60	257	3	300 MCM	1	2.5	350	350	257	3	300 MCM	1	2.5	350	350
	230V/60	257	3	300 MCM	1	2.5	350	350	257	3	300 MCM	1	2.5	350	350
	380V/60	151	3	2/0 AWG	1	1.5	200	200	151	3	2/0 AWG	1	1.5	200	200
	460V/60	122	3	1 AWG	1	1.25	175	175	122	3	1 AWG	1	1.25	175	175
	400V/50	122	3	1 AWG	1	1.25	175	175	122	3	1 AWG	1	1.25	175	175
	575V/60	97	3	3 AWG	1	1	125	125	97	3	3 AWG	1	1	125	125

Electrical Data

Table 32: Electrical Data - Mutli-point (50/60 Hz) continued

AGZ	Volts/ Phase	Circuit #1							Circuit #2						
		MCA	Field Wire		Field Hub.		Fuse Size		MCA	Field Wire		Field Hub.		Fuse Size	
			Qty	Wire GA	Qty	Size	Rec.	Max.		Qty	Wire GA	Qty	Size	Rec.	Max.
110D	208V/60	274	3	300 MCM	1	2.5	300	300	274	3	300 MCM	1	2.5	300	300
	230V/60	274	3	300 MCM	1	2.5	300	300	274	3	300 MCM	1	2.5	300	300
	380V/60	141	3	1/0 AWG	1	1.5	175	175	141	3	1/0 AWG	1	1.5	175	175
	460V/60	114	3	2 AWG	1	1.25	125	125	114	3	2 AWG	1	1.25	125	125
	400V/50	114	3	2 AWG	1	1.25	125	125	114	3	2 AWG	1	1.25	125	125
	575V/60	94	3	3 AWG	1	1	110	110	94	3	3 AWG	1	1	110	110
125D	208V/60	312	3	400 MCM	1	2.5	350	350	321	3	400 MCM	1	2.5	400	400
	230V/60	312	3	400 MCM	1	2.5	350	350	321	3	400 MCM	1	2.5	400	400
	380V/60	141	3	1/0 AWG	1	1.5	175	175	186	3	3/0 AWG	1	2	225	225
	460V/60	114	3	2 AWG	1	1.25	125	125	159	3	2/0 AWG	1	1.5	200	200
	400V/50	114	3	2 AWG	1	1.25	125	125	159	3	2/0 AWG	1	1.5	200	200
	575V/60	94	3	3 AWG	1	1	110	110	117	3	1 AWG	1	1.25	125	125
130D	208V/60	321	3	400 MCM	1	2.5	400	400	321	3	400 MCM	1	2.5	400	400
	230V/60	321	3	400 MCM	1	2.5	400	400	321	3	400 MCM	1	2.5	400	400
	380V/60	186	3	3/0 AWG	1	2	225	225	186	3	3/0 AWG	1	2	225	225
	460V/60	159	3	2/0 AWG	1	1.5	200	200	159	3	2/0 AWG	1	1.5	200	200
	400V/50	159	3	2/0 AWG	1	1.5	200	200	159	3	2/0 AWG	1	1.5	200	200
	575V/60	117	3	1 AWG	1	1.25	125	125	117	3	1 AWG	1	1.25	125	125
140D	208V/60	329	3	400 MCM	1	2.5	400	400	329	3	400 MCM	1	2.5	400	400
	230V/60	329	3	400 MCM	1	2.5	400	400	329	3	400 MCM	1	2.5	400	400
	380V/60	190	3	3/0 AWG	1	2	225	225	190	3	3/0 AWG	1	2	225	225
	460V/60	163	3	2/0 AWG	1	1.5	200	200	163	3	2/0 AWG	1	1.5	200	200
	400V/50	163	3	2/0 AWG	1	1.5	200	200	163	3	2/0 AWG	1	1.5	200	200
	575V/60	120	3	1 AWG	1	1.25	150	150	120	3	1 AWG	1	1.25	150	150
160D	208V/60	329	3	400 MCM	1	2.5	400	400	415	6	4/0 AWG	2	2	500	500
	230V/60	329	3	400 MCM	1	2.5	400	400	415	6	4/0 AWG	2	2	500	500
	380V/60	190	3	3/0 AWG	1	2	225	225	246	3	250 MCM	1	2	300	300
	460V/60	163	3	2/0 AWG	1	1.5	200	200	196	3	3/0 AWG	1	2	225	225
	400V/50	163	3	2/0 AWG	1	1.5	200	200	196	3	3/0 AWG	1	2	225	225
	575V/60	120	3	1 AWG	1	1.25	150	150	160	3	2/0 AWG	1	1.5	200	200
180D	208V/60	454	6	4/0 AWG	2	2	500	500	454	6	4/0 AWG	2	2	500	500
	230V/60	415	6	4/0 AWG	2	2	500	500	415	6	4/0 AWG	2	2	500	500
	380V/60	246	3	250 MCM	1	2	300	300	246	3	250 MCM	1	2	300	300
	460V/60	204	3	4/0 AWG	1	2	250	250	204	3	4/0 AWG	1	2	250	250
	400V/50	204	3	4/0 AWG	1	2	250	250	204	3	4/0 AWG	1	2	250	250
	575V/60	160	3	2/0 AWG	1	1.5	200	200	160	3	2/0 AWG	1	1.5	200	200
190D	208V/60	462	6	250 MCM	2	2	500	500	462	6	250 MCM	2	2	500	500
	230V/60	423	6	4/0 AWG	2	2	500	500	423	6	4/0 AWG	2	2	500	500
	380V/60	250	3	250 MCM	1	2	300	300	250	3	250 MCM	1	2	300	300
	460V/60	208	3	4/0 AWG	1	2	250	250	208	3	4/0 AWG	1	2	250	250
	400V/50	208	3	4/0 AWG	1	2	250	250	208	3	4/0 AWG	1	2	250	250
	575V/60	163	3	2/0 AWG	1	1.5	200	200	163	3	2/0 AWG	1	1.5	200	200

Table 33: Wiring Data - Single Point (50/60 Hz) Standard and HSCCR Panels

Model	Volts/Phase	Power Block		Disconnect*	
		Size	Lug Range	Size	Lug Range
025D	208V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	230V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	380V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	460V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	400V/50	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	575V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
030D	208V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	230V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	380V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	460V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	400V/50	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	575V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
035D	208V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	230V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	380V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	460V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	400V/50	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	575V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
040D	208V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	230V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	380V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	460V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	400V/50	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	575V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
045D	208V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	230V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	380V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	460V/60	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
	400V/50	380A	(1) 500 - #4	100A*	(1) 1/0 - #14
050D	575V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	380V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	460V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	400V/50	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
055D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	380V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	460V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	400V/50	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	575V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14

Notes: *** On HSCCR unit: 400A & (1) 600-#4**

**** On HSCCR unit: (2) 350 - #2/0**

Table 34: Wiring Data - Single Point (50/60 Hz) continued

Model	Volts/Phase	Power Block		Disconnect*	
		Size	Lug Range	Size	Lug Range
060D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	380V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	460V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	400V/50	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	575V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
065D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	380V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	460V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	400V/50	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
	575V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
070D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	380V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	460V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	400V/50	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	575V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
075D	208V/60	760A	(2) 500 - #4	400A	(2) 250 - #1 **
	230V/60	760A	(2) 500 - #4	400A	(2) 250 - #1 **
	380V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	460V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	400V/50	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	575V/60	380A	(1) 500 - #4	150A*	(1) 1/0 - #14
080D	208V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	230V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	380V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	460V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	400V/50	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	575V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
090D	208V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	230V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	380V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	460V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	400V/50	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	575V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
100D	208V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	230V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	380V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	460V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	400V/50	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	575V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4

Notes: *** On HSCCR unit: 400A & (1) 600-#4**

**** On HSCCR unit: (2) 350 - #2/0**

Table 35: Wiring Data - Single Point (50/60 Hz) continued

Model	Volts/Phase	Power Block		Disconnect*	
		Size	Lug Range	Size	Lug Range
110D	208V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	230V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	380V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	460V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	400V/50	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
	575V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
125D	208V/60	760A	(2) 500 - #4	800A	(4) 500 - 3/0
	230V/60	760A	(2) 500 - #4	800A	(4) 500 - 3/0
	380V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	460V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	400V/50	380A	(1) 500 - #4	400A	(1) 600 - #1
	575V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
130D	208V/60	760A	(2) 500 - #4	800A	(4) 500 - 3/0
	230V/60	760A	(2) 500 - #4	800A	(4) 500 - 3/0
	380V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	460V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	400V/50	380A	(1) 500 - #4	400A	(1) 600 - #1
	575V/60	380A	(1) 500 - #4	250A*	(1) 4/0 - #4
140D	208V/60	760A	(2) 500 - #4	800A	(4) 500 - 3/0
	230V/60	760A	(2) 500 - #4	800A	(4) 500 - 3/0
	380V/60	380A	(1) 500 - #4	600A	(2) 350 - 2/0
	460V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
	400V/50	380A	(1) 500 - #4	400A	(1) 600 - #1
	575V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
160D	208V/60	1000A	(4) 600 - #2	800A	(4) 500 - 3/0
	230V/60	1000A	(4) 600 - #2	800A	(4) 500 - 3/0
	380V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	460V/60	760A	(2) 500 - #4	400A	(1) 600 - #1
	400V/50	760A	(2) 500 - #4	400A	(1) 600 - #1
	575V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
180D	208V/60	1000A	(4) 600 - #2	1000A	(4) 500 - 3/0
	230V/60	1000A	(4) 600 - #2	1000A	(4) 500 - 3/0
	380V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	460V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	400V/50	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	575V/60	380A	(1) 500 - #4	400A	(1) 600 - #1
190D	208V/60	1000A	(4) 600 - #2	1000A	(4) 500 - 3/0
	230V/60	1000A	(4) 600 - #2	1000A	(4) 500 - 3/0
	380V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	460V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	400V/50	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	575V/60	380A	(1) 500 - #4	400A	(1) 600 - #1

Notes: *** On HSCCR unit: 400A & (1) 600-#4**

**** On HSCCR unit: (2) 350 - #2/0**

Electrical Data

Table 36: Wiring Data - Multi-point (50/60 Hz)

Model	Volts/ Phase	Circuit #1				Circuit #2			
		Power Block		Disconnect Switch		Power Block		Disconnect Switch	
		Size	Lug Range	Size	Lug Range	Size	Lug Range	Size	Lug Range
025D	208V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	230V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
030D	208V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	230V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
035D	208V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	230V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
040D	208V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	230V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
045D	208V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	230V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
050D	208V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	230V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
055D	208V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	230V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14

Table 37: Wiring Data - Multi-point (50/60 Hz) continued

Model	Volts/ Phase	Circuit #1				Circuit #2			
		Power Block		Disconnect Switch		Power Block		Disconnect Switch	
		Size	Lug Range	Size	Lug Range	Size	Lug Range	Size	Lug Range
060D	208V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	230V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
065D	208V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	230V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
070D	208V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	230V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	380V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
075D	208V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	230V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	380V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
080D	208V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	230V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	380V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
090D	208V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	230V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	380V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	460V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14
100D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	380V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	460V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14	175A	(1) 2/0 - #14	100A [1]	(1) 1/0 - #14

Table 38: Wiring Data - Multi-point (50/60 Hz) continued

Model	Volts/ Phase	Circuit #1				Circuit #2			
		Power Block		Disconnect Switch		Power Block		Disconnect Switch	
		Size	Lug Range	Size	Lug Range	Size	Lug Range	Size	Lug Range
110D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	380V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	460V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	400V/50	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
	575V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
125D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	380V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	460V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	400V/50	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	575V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
130D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	380V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	460V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	400V/50	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	575V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
140D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	380V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	460V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	400V/50	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
	575V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14
160D	208V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	230V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	380V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	400A	(1) 600 - #1
	460V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	400V/50	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	575V/60	175A	(1) 2/0 - #14	150A	(1) 1/0 - #14	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
180D	208V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	230V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	380V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	460V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	400V/50	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	575V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4
190D	208V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	230V/60	760A	(2) 500 - #4	600A	(2) 350 - 2/0	760A	(2) 500 - #4	600A	(2) 350 - 2/0
	380V/60	380A	(1) 500 - #4	400A	(1) 600 - #1	380A	(1) 500 - #4	400A	(1) 600 - #1
	460V/60	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	400V/50	380A	(1) 500 - #4	250A	(1) 4/0 - #4	380A	(1) 500 - #4	250A	(1) 4/0 - #4
	575V/60	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4	175A	(1) 2/0 - #14	250A	(1) 4/0 - #4

Pre Start-up

Inspected the chiller to ensure no components became loose or damaged during shipping or installation including leak test and wiring check.

Pre-Startup Water Piping Checkout

1. Check the pump operation and vent all air from the system.
2. Circulate evaporator water, checking for proper system pressure and evaporator pressure drop. Compare the pressure drop to the evaporator water pressure drop curve.
3. Flush System and clean all water strainers before placing the chiller into service.
4. Check water treatment and proper glycol percent.

Pre-Startup Refrigerant Piping Checkout

1. Check all exposed brazed joints for evidence of leaks. Joints may have been damaged during shipping or when the unit was installed.
2. Check that all refrigerant valves are either opened or closed as required for proper operation of the chiller.
3. A thorough leak test must be done using an approved electronic leak detector. Check all valve stem packing for leaks. Replace all refrigerant valve caps and tighten.
4. Check all refrigerant lines to insure that they will not vibrate against each other or against other chiller components and are properly supported.
5. Check all connections and all refrigerant threaded connectors.
6. Look for any signs of refrigerant leaks around the condenser coils and for damage during shipping or installation.
7. Connect refrigerant service gauges to each refrigerant circuit before starting unit.

Pre-Startup Electrical Check Out

⚠ WARNING

Electrical power must be applied to the compressor crankcase heaters 8 hours before starting unit to eliminate refrigerant from the oil.

1. Open all electrical disconnects and check all power wiring connections. Start at the power block and check all connections through all components to and including the compressor terminals. These should be checked again after 3 months of operation and at least yearly thereafter.
2. Check all control wiring by pulling on the wire at the spade connections and tighten all screw connections. Check plug-in relays for proper seating and to insure retaining clips are installed.
3. Put System Switch (S1) to the Emergency Stop position.
4. Put both circuit #1 & #2 switches to the Pumpdown and Stop position.
5. Apply power to the unit. The panel Alarm Light will stay on until S1 is closed. Ignore the Alarm Light for the check out period. If you have the optional Alarm Bell, you may wish to disconnect it.
6. Check at the power block or disconnect for the proper voltage and proper voltage between phases. Check power for proper phasing using a phase sequence meter before starting unit.
7. Check for 120 Vac at the optional control transformer and at TB-2 terminal #1 and the neutral block (NB).
8. Check between TB-2 terminal #7 and NB for 120 Vac supply for transformer #2.
9. Check between TB-2 terminal #2 and NB for 120 Vac control voltage. This supplies the compressor crank case heaters.
10. Check between TB-3 terminal #17 and #27 for 24 Vac control voltage.

Start-Up

Refer to the MicroTech III Controller information in the operating manual OMM 1078 to become familiar with unit operation before starting the chiller.

There should be adequate building load (at least 50 percent of the unit full load capacity) to properly check the operation of the chiller refrigerant circuits.

Be prepared to record all operating parameters required by the "Compressorized Equipment Warranty Form". Return this information within 10 working days to McQuay International as instructed on the form to obtain full warranty benefits.

Start-Up Steps

- Verify chilled water flow.
- Verify remote start / stop or time clock (if installed) has requested the chiller to start.
- Set the chilled water setpoint to the required temperature. (The system water temperature must be greater than the total of the leaving water temperature setpoint plus one-half the control band plus the start-up delta-T before the MicroTech III controller will stage on cooling.)
- Set the Evap Delta T based on a percent of unit nominal flow indicated in Table 12 and the Start Delta T as a starting point. Delta-T=Tons x 24 / gpm
- Check the controller setpoints to be sure that factory defaults are appropriate.
- Put both pumpdown switches (PS1 and PS2) to the ON position.
- Put system switch (S1) to ON position

Table 39: Pumpdown and System Switch Positions

Switch	Switch Position	
	ON	OFF
PS1, PS2, Pumpdown Switches	Circuits will operate in the normal, automatic mode	Circuit will go through the normal pumpdown cycle and shut off.
S1, System Switch	Unit will operate in the normal automatic mode	Unit will shut off immediately without pumping down (emergency stop)

Post Start-up

After the chiller has been operating for a period of time and has become stable, check the following:

- Compressor oil level. (Some scroll compressors do not have oil sight glasses.)
- Refrigerant sight glass for flashing
- Rotation of condenser fans
- Complete the "Compressorized Equipment Warranty Form"

Shutdown

Temporary Shutdown

1. Put both circuit switches to the OFF position (Pumpdown and Stop).
2. After compressors have stopped, put System Switch (S1) to OFF (emergency stop).
3. Turn off chilled water pump. Chilled water pump to operate while compressors are pumping down.
4. To start the chiller after a temporary shutdown, follow the start-up instructions.

Extended Shutdown

1. Front seat both condenser liquid line service valves.
2. Put both circuit switches to the OFF position (Pumpdown and Stop position).
3. After the compressors have stopped, put System Switch (S1) to the OFF position (emergency stop).
4. Front seat both refrigerant circuit discharge valves (if applicable).
5. If chilled water system is not drained, maintain power to the evaporator heater to prevent freezing. Maintain heat tracing on the chilled water lines.
6. Drain evaporator and water piping to prevent freezing.
7. If electrical power to the unit is on, the compressor crankcase heaters will keep the liquid refrigerant out of the compressor oil. This will minimize start-up time when putting the unit back into service. The evaporator heater will be able to function.
8. If electrical power is off, make provisions to power the evaporator heater (if chilled water system is not drained or is filled with suitable glycol). Tag all opened electrical disconnect switches to warn against start-up before the refrigerant valves are in the correct operating position. To start the chiller after an extended shutdown, follow the prestart-up and start-up instructions.

Component Operation

Hot Gas Bypass (Optional)

This option allows the system to operate at lower loads without excessive on/off compressor cycling. The hot gas bypass option is required to be on both refrigerant circuits because of the lead / lag feature of the controller.

This option allows passage of discharge gas into the evaporator inlet (between the TX valve and the evaporator) which generates a false load to supplement the actual chilled water or air handler load.

Note: The hot gas bypass valve will not generate a 100% false load.

The pressure regulating valve is factory set to begin opening at 102 psig with R-410a and can be changed by changing the pressure setting. The adjustment range is 75 to 150 psig. To raise the pressure setting, remove the cap on the bulb and turn the adjustment screw clockwise. To lower the setting, turn the screw counterclockwise. Do not force the adjustment beyond the range it is designed for, as this will damage the adjustment assembly. The regulating valve opening point can be determined by slowly reducing the system load while observing the suction pressure. When the bypass valve starts to open, the refrigerant line on the evaporator side of the valve will begin to feel warm to the touch.

A solenoid valve is located ahead of the bypass valve and is controlled by the MicroTech III controller. It is active when the first stage of cooling on a circuit is active.

⚠ WARNING

The hot gas line may become hot enough to cause injury. Be careful during valve checkout.

VFD Low Ambient Control (Optional)

The optional VFD fan control is used for unit operation below 35 F (2 C) down to a minimum of -10 F (-23.3 C). The control looks at the saturated discharge temperature and varies (pressure) at the "target" temperature. This temperature is established as an input to a setpoint screen labeled "Sat Condenser Temp Target".

Filter-Driers

Each refrigerant circuit is furnished with a replaceable core type filter-drier. The core assembly of the replaceable core drier consists of a filter core held tightly in the shell in a manner that allows full flow without bypass. Pressure drop across the filter drier must not exceed the following values.

PERCENT CIRCUIT LOADING (%)	DROP ACROSS (KPA)
100%	10 (69)
75%	8 (55.2)
50%	5 (34.5)
25%	4 (27.6)

A condenser liquid line service valve is provided for isolating the charge in the condenser, but also serves as the point from which the liquid line can be pumped out. With the line free of refrigerant, the filter-drier core(s) can be easily replaced.

System Adjustment

To maintain peak performance at full load operation, the system superheat and liquid subcooling may require adjustment. Read the following subsections closely to determine if adjustment is required.

Liquid Line Sight Glass

The color of the moisture indicator is an indication of the dryness of the system and is extremely important when the system has been serviced. Immediately after the system has been opened for service, the element may indicate a wet condition. It is recommended that the equipment operate for approximately 12 hours to allow the system to reach equilibrium before deciding if the system requires a change of drier cores.

Bubbles in the sight glass at constant full load indicates a shortage of refrigerant, a plugged filter-drier, or a restriction in the liquid line. However, it is not unusual to see bubbles in the sight glass during changing load conditions.

Expansion Valve

The expansion valve's function is to keep the evaporator supplied with the proper amount of refrigerant to satisfy the load conditions.

Before adjusting superheat, check that unit charge is correct and liquid line sight glass is full with no bubbles and that the circuit is operating under stable, full load conditions.

The suction superheat for the suction leaving the evaporator is set at the factory for 10 to 12 degrees F at full load. To have full rated unit performance, the superheat must be about 8 degrees F at 95°F outdoor ambient temperature.

Crankcase Heaters

The scroll compressors are equipped with externally mounted band heaters located at the oil sump level. The function of the heater is to keep the temperature in the crankcase high enough to prevent refrigerant from migrating to the crankcase and condensing in the oil during off-cycle.

Power must be supplied to the heaters 8 hours before starting the compressors.

Evaporator

On models AGZ-025D through 130D, the evaporator is a compact, high efficiency, dual circuit, brazed plate-to-plate type heat exchanger consisting of parallel stainless steel plates. The evaporator is protected with an electric resistance heater and insulated with 3/4" (19mm) thick closed-cell polyurethane insulation. This combination provides freeze protection down to -20°F (-29°C) ambient air temperature. The water side

working pressure of the brazed plate type of evaporator is 653 psig (4502 kPa). Evaporators are designed and constructed according to, and listed by, Underwriters Laboratories (UL).

On models AGZ-140D through -190D, the evaporator is a direct-expansion, shell-and-U-tube type with water flowing in the baffled shell side, and refrigerant flowing through the tubes. The evaporator has an insertion heater and is insulated with 3/4" (19 mm) thick vinyl nitrate polymer sheet insulation, protecting against water freeze-up at ambient air temperatures to -20° F (29° C). An water thermostat controls the heater cable. The fitted and glued-in-place insulation has a K factor of 0.28 Btu in/hr ft2 ºF at 75°F. The water side working pressure of the shell-and-tube type of evaporator is 152 psig (1048 kPa). Each evaporator is designed, constructed, inspected, and stamped according to the requirements of the ASME Boiler and Pressure Vessel Code. Double thickness insulation is available as an option.

Phase Voltage Monitor (Optional)

Factory settings are as follows:

- Trip Delay Time: 2 seconds.
- Voltage Setting: set at nameplate voltage.
- Restart Delay Time: 60 seconds.

Factory or field installed louvers are available for protection against fin damage from hail. Protection against negative operating effects from wind as well as hail protection can be achieved from McQuay box-type enclosures described below.

Wind Baffles/Hail Guards are a field-installed option that is used to stabilize unit operation in high wind areas and to assist in operation at low ambient temperatures.

Figure 32 is a sketch of a typical panel assembly on an AGZ unit. The actual number of panels and parts will vary by model size, being one set per fan, on each side (see Physical Data tables (beginning on page 28 for the number of fans). The parts are shown in the Table 40 and referenced by balloon numbers.

Table 40: Packing List

Description	Part Number	Bubble Number
Vertical Support Rib	074758501	1
Top Cover	330409401	2
Front Panel	330409501	3
¼ - 20 x ½" Screw (Place in Poly Bag)	046093807	

Figure 31: Components

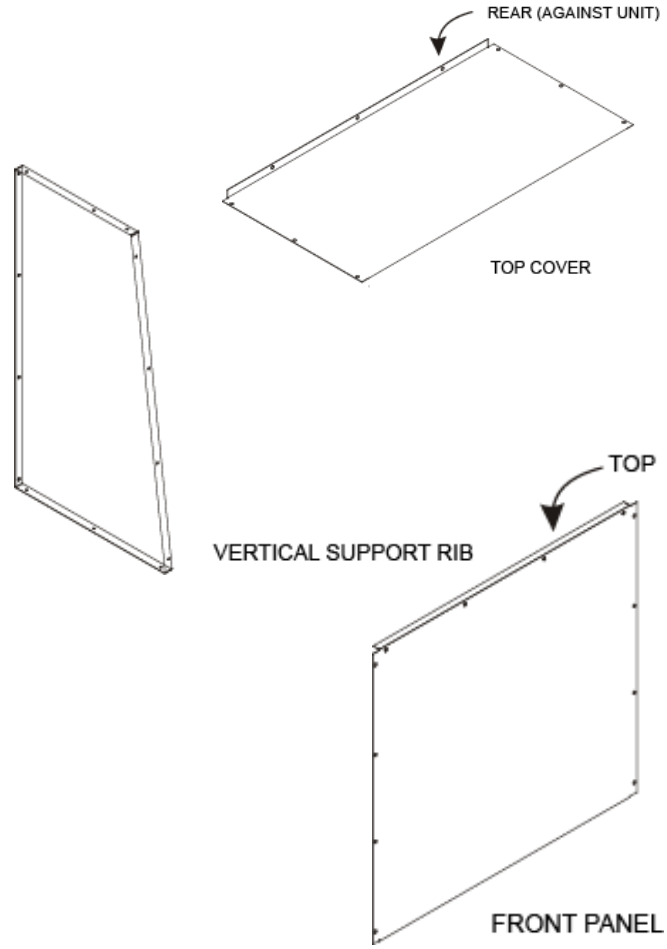
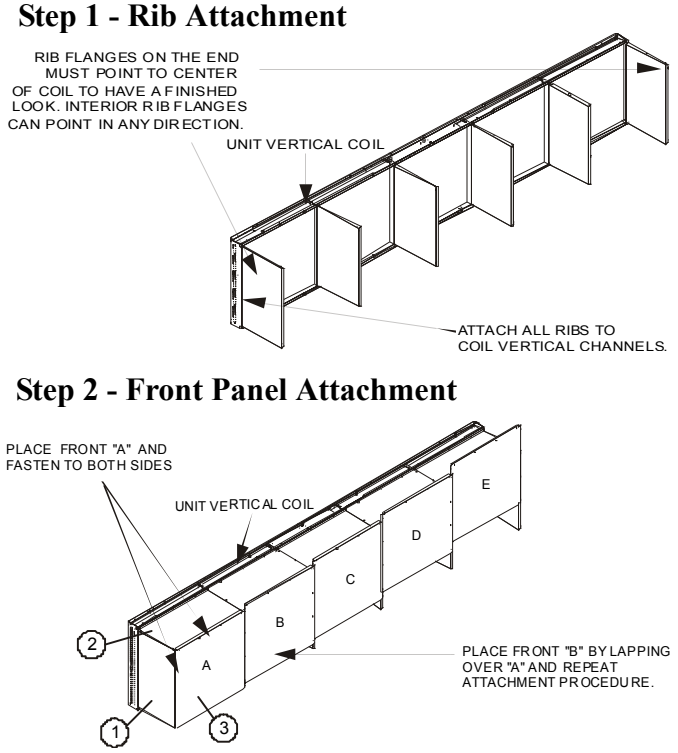


Figure 32: Installation Sequence


Step 1 - Rib Attachment
RIB FLANGES ON THE END MUST POINT TO CENTER OF COIL TO HAVE A FINISHED LOOK. INTERIOR RIB FLANGES CAN POINT IN ANY DIRECTION.
UNIT VERTICAL COIL
ATTACH ALL RIBS TO COIL VERTICAL CHANNELS.
Step 2 - Front Panel Attachment
PLACE FRONT "A" AND FASTEN TO BOTH SIDES
UNIT VERTICAL COIL
A
B
C
D
E
1
2
3
PLACE FRONT "B" BY LAPPING OVER "A" AND REPEAT ATTACHMENT PROCEDURE.
Step 3 - Top Panel Attachment
ATTACH TOP "A" AT HORIZONTAL COIL CHANNEL FIRST. THIS WILL SQUARE THE PANEL. OVERLAP THE FRONT PANEL FLANGE.
UNIT VERTICAL COIL
ATTACH LEFT SIDE SECOND. LAP PANEL "B" OVER PANEL "A" AND REPEAT ATTACHMENT PROCEDURE.
Top Panel, Install Last
Front Panel, Install Second
Rib. Install

Revision History

Number	Date	Description
IM 1100	10-18-09	Initial Release

McQuay Training and Development

Now that you have made an investment in modern, efficient McQuay equipment, its care should be a high priority. For training information on all McQuay HVAC products, please visit us at www.mcquay.com and click on training, or call 540-248-9646 and ask for the Training Department.

Warranty

All McQuay equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local McQuay Representative for warranty details. Refer to Form 933-43285Y. To find your local McQuay Representative, go to www.mcquay.com.

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to www.mcquay.com.

McQuay® International
a member of DAIKIN group

© 2010 McQuay International • www.mcquay.com • 800-432-1342